BEFORE THE ILLINOIS POLLUTION CONTROL BOARD

IN THE MATTER OF:	)	
	)	AS 2021-003
Petition of Midwest Generation	)	
for an Adjusted Standard from 845.740(a)	)	
and a Finding of Inapplicability of Part 845	)	(Adjusted Standard)
(Waukegan Station)	)	

To: See attached service list.

NOTICE OF ELECTRONIC FILING

PLEASE TAKE NOTICE that I have today filed with the Office of the Clerk of the Pollution Control Board the Illinois Environmental Protection Agency's RECOMMENDATION, a copy of which is herewith served upon you.

Dated: October 31, 2022

Respectfully submitted,
ILLINOIS ENVIRONMENTAL PROTECTION AGENCY,

Respondent,

BY: /s/Sara Terranova
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(Waukegan Station)	)	

RECOMMENDATION

The Illinois Environmental Protection Agency ("Illinois EPA" or "Agency"), by one of its attorneys, hereby files its Recommendation concerning the Midwest Generation LLC's ("MWG") Waukegan Station in Waukegan, Lake County, Illinois, pursuant to Section 28.1 of the Illinois Environmental Protection Act ("Act"), 415 ILCS 5/28.1, and 35 Ill. Adm. Code §104.416. For the reasons stated below, Illinois EPA recommends that the Board DENY Petitioner's request for an adjusted standard from 845.740(a) and DENY Petitioner's request for a finding of inapplicability of Part 845. In support of its Recommendation, the Illinois EPA states as follows:

BACKGROUND

1. Pursuant to 415 ILCS 5/22.59(g)(1), the Board was directed to adopt rules for coal combustion residuals ("CCR" surface impoundments "at least as protective and comprehensive" as Subpart D of 40 CFR 257 ("Part 257") and to use Part 257 "as a baseline." 415 ILCS 5/22.59(g)(1) and *In the Matter of: Standards for Disposal of Coal Combustion Residuals in Surface Impoundments: Proposed New 35 Ill. Adm. Code 845*, R20-19 ("R20-19"), Order (February 4, 2021), at 11.

2. On April 15, 2021, the Board adopted new regulations providing standards for disposal of CCR in surface impoundments at 35 Ill. Adm. Code 845 ("Part 845"). R-20-19, Final Order (April 15, 2021). The Part 845 rules became effective on April 21, 2021. 45 Ill. Reg. 5884 (May 7, 2021).

3. While independent of the federal rule, Part 845 complies with the statutory mandate in 415 ILCS 5/22.59(g)(1) and is based on Part 257 and written with "at least the same protection and comprehensiveness" as Part 257. R20-19, Order (February 4, 2021), at 11.

4. On May 11, 2021, MWG filed a "Petition for an Adjusted Standard and a Finding of Inapplicability for Waukegan Station" ("Petition" or "Pet."), concerning two areas that Petitioner designates as: (1) the East Pond, and (2) the Grassy Field. *See* Petition at 1.

5. On September 17, 2021, MWG filed an "Amended Petition for an Adjusted Standard and a Finding of Inapplicability for Waukegan Station" ("Amended Petition" or "Amd. Pet.") concerning two areas that Petitioner designates as: (1) the West Pond (instead of the East Pond as originally proposed); and (2) the Grassy Field. *See* Amended Petition at 1.

6. Specifically, MWG is seeking the following adjusted standard for standards contained in Part 845:

a. West Pond: MWG seeks an adjusted standard for the West Pond to allow the decontamination and retention of its existing liner rather than the liner's removal required for closure by removal provided in Section 845.740(a).

b. Grassy Field: MWG asserts the Grassy Field does not satisfy the regulatory definition of a CCR surface impoundment and seeks an adjusted standard finding that Part 845 of the Board's regulations is inapplicable.

7. Illinois EPA must make a recommendation to the Board as to the disposition of the Petition within 45 days after the filing of the petition or at least 30 days before a hearing, unless otherwise ordered by the hearing officer or Board. 35 Ill. Adm. Code §104.416. Pursuant to Motions for Extension of Time, the Board has ordered that the Agency file its Recommendation by October 31, 2022.

8. Illinois EPA will address Petitioner's request for a finding of inapplicability of Grassy Field from Part 845 first, and then the request for an adjusted standard exempting the West Pond from the closure by removal requirements under Section 845.740 second.

I. GRASSY FIELD

GRASSY FIELD, EAST POND, AND WEST POND ORIGINATED FROM OLD POND

9. The Petitioner is correct in its historical recounting that "well before the Illinois EPA proposed the Illinois CCR Rule, there was a flat area of grass located to the west of the West Pond called the 'Grassy Field'." *See* Pet. at 10. However, well before the Grassy Field was graded and seeded (*See* Agency Exhibit 33) a CCR surface impoundment, Old Pond, existed and operated in this area. *See* Agency Exhibit 2. This now inactive CCR surface impoundment comprises the areas of the Grassy Field, East Pond, and West Pond. *See* Agency Exhibit 5.

10. Old Pond, has also been referred to in various permit documents as the "Slag-ash Field" or "Settling Basin," or "ash Pond". *See* Agency Exhibits 32, 33, 35, 36, 38, and 39.[1]

11. Based on measurements from aerial photos, Old Pond originated as a 30-acre sand dune field off the Lake Michigan shoreline. *See* Agency Exhibit 1. Over time, liquid and CCR were deposited within the entirety of Old Pond. *Id.* Eventually, Old Pond was modified and divided into three, approximate 10-acre areas. *See* Agency Exhibit 4. The western third of Old Pond became the Grassy Field, which was ultimately graded and seeded with no further modification or construction. *See* Agency Exhibit 41 at 4 and Agency Ex. 45 at 13. The eastern two-thirds of Old

[1] Agency Ex.35 at 10 "ash Pond"; Exhibit 36 at 28 "slag-ash field"; Agency Ex. 32 at 3 "slag-field and settling basin", Id. at 5 "settling basin (slag field) ; Id. at 10/ "slag field and settling basin", ID. at 17 "slag field (settling basin)", Agency Exhibit 38 at 4 "slag field and settling basin" , Id. at 8 "Ash Settling Pond" , Id. at 104 "settling basin" ; Exhibit 33 at 23 "the existing ash pond will be modified to pond will be modified to provide for easier and redundant operations. The existing single pond will be split into two separate ponds … each about 10 acres" Exhibit 39 at 11 "Ash Pond").

Pond became what is now known as the East Pond and West Pond, two operational CCR surface impoundments. *See* Agency Exhibit. 45 at 13 and Agency Exhibit 33 at 23.

REQUEST FOR FINDING OF INAPPLICABILITY

12. MWG asserts that the Grassy Field does not meet the definition of a CCR surface impoundment and is therefore "seeking an adjusted standard finding that the CCR rules are inapplicable to the Grassy Field." *See* Petition, p. 2. However, as outlined above, because the Grassy Field sits within the footprint of Old Pond, it must first be established whether Old Pond is a CCR surface impoundment under Part 845. If Old Pond is a CCR surface impoundment, then Grassy Field is also a CCR surface impoundment.

DEFINITIONS

13. A "CCR surface impoundment" is defined as a natural topographic depression, man-made excavation, or diked area, which is designed to hold an accumulation of CCR and liquids, and the surface impoundment treats, stores, or disposes of CCR. 415 ILCS 5/3.143, 35 Ill. Adm. Code 845.120, and 40 CFR 257.2

14. An "Inactive CCR surface impoundment" is defined as a CCR surface impoundment in which CCR was placed before but not after October 19, 2015 and still contains CCR on or after October 15, 2015." Inactive CCR surface impoundments may be located at an active facility or an inactive facility. 35 Ill. Adm. Code 845.120.

GRASSY FIELD IS A CCR SURFACE IMPOUNDMENT

FEDERAL GUIDANCE

15. Part 845 is a based on Part 257 and provides at least the same protection and comprehensiveness as Part 257. Therefore, one must look to the preamble of Part 257 to examine

the definition of a CCR surface impoundment and its intended applicability. R20-19, Order (February 4, 2021), at 11.

16. "The final definition [of a CCRSI] makes extremely clear the impoundments that are covered by the rule, so an owner or operator will be able to easily discern whether a particular unit is a CCR surface impoundment." 80 Fed. Reg. 21357 (April 17, 2015).

17. The United States Environmental Protection Agency (U.S. EPA) provided: 1) examples of CCR surface impoundments, 2) stated how CCRSIs are used, and 3) provided an applicable scenario of how the definition could be met. *Id.*

18. "Examples of CCR surface impoundments are holding, storage, settling and aeration pits, ponds, and lagoons." 80 Fed. Reg. 21357 (April 17, 2015). A settling pond is a type of waste treatment system designed to either convey or retain, concentrate, settle, reduce, or remove pollutants, either actively or passively, from wastewater prior to discharge (or eliminating any such discharge). 40 CFR 120.2(3)(xv). Old Pond is a settling pond. See Agency Exhibit 32 at 5 and 17, Agency Exhibit 36 at 28, and Agency Exhibit 38 at 4.

19. By 1946, Old Pond utilized the natural topographic depression within the dune field to settle CCR from sluice water prior to discharge. *See* Agency Exhibit 2. The water from the sluiced waste water was treated by settling out the solid CCR prior to discharge. *See* Agency Exhibit 2. As the CCR sluice water flowed into the depressions, the naturally sandy conditions allowed the water to slow down and infiltrate into the ground. Fast moving water, such as in the sluice lines, can carry a larger sediment load, in the instance of Old Pond the sediment was CCR. When the water entered Old Pond it slowed down and lost energy, causing the CCR to settle out of the water as it flowed across the dunes and into the dune swales, thus treating the CCR sluice water and

leaving CCR behind. The CCR was stored in the bottom of the natural depressions. *See* Agency Exhibit 2.

20. By 1974, the design within Old Pond was modified. Old pond utilized designed, man-made excavations and dikes (berms) within the dune field to settle CCR from sluice water prior to discharge. *See* Agency Exhibit 4 and Agency Exhibit 32 at 5 and 17.

21. Agency Exhibit 4 depicts what appears to be a low berm on the eastern edge of Old pond. These berms would have controlled the flow of sluice water to allow settling before discharge of water and further CCR storage. The berms being used to control sluice water are more evident in the 1974 photo. *See* Agency Exhibit 4. Moving from west to east, an apparent berm is visible about one third of the way across Old Pond and there is what appears to be a pool of water east of that berm. This is an accumulation of water with CCR storage occurring all around it. Berms also appear to exist on the southern and eastern portions of Old Pond in the 1974 photo. Another apparent berm is located about two thirds of the way across Old Pond, with what appears to be a ditch just to its west. The ditch correlates with the location of one of the culverts indicated in permit 1974EB0346. *See* Agency Exhibit 32 at 17. The water accumulated in the basin would flow out of the basin, through the culvert that penetrated the berm. The CCR was left behind for continued treatment and storage. *See* Agency Exhibit 4.

22. U.S. EPA stated how CCR surface impoundments are used. 80 Fed Reg at 21357 (April 17, 2015. "CCR surface impoundments are used to receive CCR that have been sluiced (flushed or mixed with water to facilitate movement)…" *Id*. Old Pond received CCR that had been sluiced. *See* Agency Exhibit 32 at 5.

23. By 1946, Old Pond was receiving CCR that had been sluiced to the dune field. *See* Agency Exhibit 2. As evidenced by photographs, the presence of what appears to be a delta from liquid

deposition, which allows liquids to flow into depressions between dune peaks, indicates that the sluice water containing CCR and liquid was sent to Old Pond. *See* Agency Exhibit 2 .

24. By 1974, Old Pond continued to receive CCR that had been sluiced to the dune field. *See* Agency Exhibit 4. The 1974 NPDES permit application demonstrates that Old Pond received sluiced CCR. *See* Agency Exhibit 36 at 28. The 1974 NPDES application states the "[a]sh and slag-coal combustion products are sluiced to the slag-ash field situated just north [sic][2] of the plant. *Id*. at 28.

25. U.S. EPA provided an applicable scenario of how the definition of a CCR surface impoundment could be met:

> …a constructed primary settling pond that received sluiced CCR directly from the electric utility would meet the definition of a CCR surface impoundment because it meets all three criteria of the definition: It is a man-made excavation and it is designed to hold an accumulation of CCR (*i.e*., directly sluiced CCR). It also engages in the treatment of CCR through its settling operation. The CCR may be subsequently dredged for disposal or beneficial use, or it may be permanently disposed of within the unit. 80 Fed Reg at 21357 (April 17, 2015).

This scenario is applicable because Old Pond was a settling pond receiving sluiced CCR from ComEd. Old Pond met the definition of a CCR surface impoundment because it utilized the natural topographic depression design within the dune field to hold an accumulation of CCR (directly sluiced CCR from ComEd). It also engaged in the treatment of CCR through its settling operation as a settling pond. *See* Agency Exhibit 2. By 1961 and 1974, Old pond designed man-made excavations and dikes (berms) within the dune field to settle CCR from sluice water directly received from the electric company prior to discharge. *See* Agency Exhibits 4 and 32.

[2] The slag-ash field is located south of the plant.

26. As U.S. EPA stated it should be[3], it is extremely clear that Old Pond (and therefore Grassy Field) meets the definition of a CCR surface impoundment. However, Petitioner argues that Grassy Field is not a depression or excavation, it is not designed to hold CCR and liquids, and it was never designed to accumulate CCR and liquid. No CCR or CCR slurry water is directed or has ever been directed to the Grassy Field." *See*. Pet. at 2. According to Petitioner, historic aerial photos and permit applications "show that the Grassy Field was never designed to accumulate CCR and liquids and was not operated to do so." *See* Pet. at 10.

27. This argument is incorrect and perhaps an attempt of a play on words. Old Pond was divided into its present configuration of three parts in 1977. *See* Agency Exhibit 5. ComEd was issued a permit stating ComEd would construct and operate two water pollution control facilities to replace the single settling basin (Old Pond) that existed previously. *See* Agency Exhibit 33 at 23. The permit established that East Pond would occupy the eastern one-third of Old Pond, West Pond would occupy the middle one-third, and the western one-third of the Old Pond, the Grassy Field, would be graded and seeded. *See* Agency Exhibit 45 at 13. Grassy Field appeared to have stopped receiving CCR by 1980. *See* Agency Exhibit 5. Grassy Field has maintained a vegetive covering with only minor modifications. *See* Agency Exhibits 13-26.

28. Although Grassy Field was graded and seeded, and has maintained a vegetive covered; Grassy Field remains a CCR surface impoundment. Grassy Field sits within the footprint of Old Pond, a CCR surface impoundment. Old Pond was a depression or excavation, was designed to hold an accumulation of CCR and liquids and the CCR surface impoundment stores or disposes of CCR. Since Old Pond was a CCR surface impoundment designed to hold an accumulation of CCR

[3] "The final definition [of a CCRSI] makes extremely clear the impoundments that are covered by the rule, so an owner or operator will be able to easily discern whether a particular unit is a CCR surface impoundment." 80 Fed. Reg. 74 at 21357 (April 17, 2015).

and liquids, and the surface impoundment stores or disposes CRR; Grassy Field is also designed to hold an accumulation of CCR and liquids, and the surface impoundment stores or disposes of CCR.

29. The notion is supported in the 2018 USWAG decision. *Util. Solid Waste Activities Grp. v. EPA,* 901 F.3d 414, 438-42 (2018). There, the D.C. Court of Appeals addressed a similar joining of the present tense "is" and the past tense "disposed of." *Id.* The Agency draws an applicable parallel here, wherein, in its discussion, the Court states the following:

> To divine its proper meaning, we must interpret the operative phrase "is disposed of" as a whole. Importantly, while the "is" retains its active present tense, the "disposal" takes the form of a past participle ("disposed"). In this way, the disposal itself can exist (it "is"), even if the act of disposal took place at some prior time. 901 F.3d 414, 438-42.

Similarly, "designed" is the past tense of "design," while "is" allows the design to exist even if the initial design was in the past. Therefore, since Old Pond was designed to hold an accumulation of CCR and liquids, Grassy Field is also designed to hold an accumulation of CCR and liquids.

30. Further, a CCR surface impoundment need not "hold" liquids during its entire active life to meet the definition of CCR surface impoundment found at Section 845.120 Act or 40 C.F.R. 257.53. The definition states in part "...is designed to hold an accumulation of CCR and liquids…". Therefore, the intended function of a manmade excavation or natural topographic depression, either with or without the use of embankments, is relevant. The word "hold" is a verb defined as "to enclose and keep in a container or within bounds" or "prevent from leaving or getting away." Synonyms include "keep" or "retain." The act of keeping or retaining can be a temporary condition. The extent to which liquids are held within an impoundment is dependent upon several factors, including its design, use, and the permeability of the bottom of the impoundment and

groundwater elevation. Old Pond was never lined and is located on beach sand, allowing rapid infiltration of liquids from the impoundment.

31. Petitioner also argues because the Illinois EPA issued a permit for a discharge, it is evident that the slag field was not used to accumulate liquid, which is a requirement to fall within the definition of "CCR surface impoundment." *See* Pet. at 11. Petitioner's claim that a CCR surface impoundment cannot discharge water to be considered a surface impoundment under Part 845 is simply not true. The interpretation is also not consistent with Petitioner's own interpretation of a CCR surface impoundment.

32. The East and West Ponds discharge under an NPDES permit IL0002259. *See* Agency Exhibit 48 at 6 and Exhibit 49 at 96. Petitioner agrees that both East and West Ponds are CCR surface impoundments. *See* Pet. at 7. Therefore, the position that the discharge from a CCR surface impoundment precludes it from regulation under Part 845 is contrary to the Petitioners own interpretation of the Rule.

33. The Petitioner also claims that because Old Pond was permitted to have a discharge, it was not used to accumulate liquids. *See* Pet. at 11. The East and West Ash Ponds have a discharge under an NPDES permit. Yet, MWG does not dispute that those settling basins are CCR surface impoundments. *See* Pet. at 7. Therefore, the position that the discharge of water from an impoundment containing water and CCR precludes the impoundment from the definition of CCR surface impoundment and hence precludes the impoundment from regulation under Part 845 is contrary to the Petitioners current operations. (Note: Waukegan Station ceased coal fired generation about June 2022.)

34. Therefore, Grassy Field is a CCR surface impoundment and must be regulated under Part 845.

GRASSY FIELD IS AN INACTIVE CCR SURFACE IMPOUNDMENT

35. Grassy Field is a CCR surface impoundment that stopped receiving CCR by 1980 when East and West Ponds were constructed on top of the eastern two thirds of Old Pond. *See* Agency Exhibit 45 at 13 and Agency Exhibit 5. Therefore, the CCR impoundment is an inactive surface impoundment because it is a CCR surface impoundment in which CCR was placed before but not after October 19, 2015 and still contains CCR on or after October 19, 2015 and is located at an active facility. 35 Ill. Admin. Code 845.120.

36. Furthermore, no mention, documentation, permit, permit application, or other evidence has been presented to the Agency showing that the Old Pond CCR materials were removed or covered in a manner that would prevent infiltration. Therefore, Old Pond has not closed under an Agency approved closure plan and has also not completed post-closure care. Because Old Pond has not closed under an Agency approved closure plan and has not completed post-closure care, Grassy Field (because it sits within the footprint of Old Pond) has not closed under an Agency approved closure plan and has not completed post-closure care.

37. Therefore, Grassy Field is an inactive CCR surface impoundment and must be regulated under Part 845.

REQUIRED ADJUSTED STANDARD ANALYSIS

38. Illinois EPA's Recommendation must set forth the rationale for the Agency's position and may present any information which the Agency believes is relevant to the Board's consideration of the proposed adjusted standard. 35 Ill. Adm. Code §104.416(a). At a minimum, the Agency must address and respond to the petition with respect to each issue raised by the requirements of Section 104.406(a) through (j). 35 Ill. Adm. Code § 104.416(b).

39. Illinois EPA hereby provides its analysis of MWG's request for an adjusted standard from Part 845 for the "Grassy Field" of MWG's Waukegan Station in Waukegan, Lake County, Illinois:

> ***35 Ill Adm. Code 104.406(a). A statement describing the standard from which an adjusted standard is sought. This must include the Illinois Administrative Code citation to the regulation of general applicability imposing the standard as well as the effective date of that regulation;***

40. MWG requests an adjusted standard from all of Part 845 for the Grassy Field, which became effective on April 21, 2021.

> ***35 Ill Adm. Code 104.406(b). A statement that indicates whether the regulation of general applicability was promulgated to implement, in whole or in part, the requirements of the CWA (33 USC 1251 et seq.), Safe Drinking Water Act (42 USC 300(f) et seq.), Comprehensive Environmental Response, Compensation and Liability Act (42 USC 9601 et seq.), CAA (42 USC 7401 et seq.), or the State programs concerning RCRA, UIC, or NPDES (see 415 ILCS 5/28.1);***

41. Illinois EPA agrees Part 845 implements Section 12, 22, and 22.59 of the Act. *See* Pet. at 16.

> ***35 Ill Adm. Code 104.406(c). The level of justification as well as other information or requirements necessary for an adjusted standard as specified by the regulation of general applicability or a statement that the regulation of general applicability does not specify a level of justification or other requirements;***

42. Illinois EPA agrees with Petitioner that since Part 845 does not specify a level of justification for an adjusted standard, the applicable level of justification are the factors identified in Section 28.1(c) of the Act, 415 ILCS 5/28.1(c) (2020).

> ***35 Ill Adm. Code 104.406(d). A description of the nature of the petitioner's activity that is the subject of the proposed adjusted standard. The description must include the location of, and area affected by, the petitioner's activity. This description must also include the number of persons employed by the petitioner's facility at issue, age of that facility, relevant pollution control equipment already in use, and the qualitative and quantitative description of the nature of emissions, discharges or releases currently generated by the petitioner's activity;***

43. According to Petitioner, the Grassy Field is approximately 10-acres and has never received sluiced liquid CCR. Rather, Petitioner describes the Grassy Field as "…an area of historic

unconsolidated fill. The Board stated that unconsolidated areas of CCR do not "fit the definition of 'CCR surface impoundment' and would therefore not be regulated by the framework of Part 845, nor were they included in the mandate of Section 22.59(g), and that "regulation of these unconsolidated coal ash fill and piles is beyond the scope of Section 22.59(g)…" *In the Matter of Standards for the Disposal of Coal Combustion Residuals in Surface Impoundments: Proposed New 35 Ill. Adm Code 845*, PCB 20-19 Order (February 4, 2021), at 12." *See* Pet. at 17. This characterization, as explained above, is inaccurate as aerial photos from 1946, 1961, and 1974 and the 1974 NPDES permit application demonstrate the Grassy Field received sluiced CCR when it was part of the larger Old Pond. *See* Agency Exhibits 2 and 3 and Agency Exhibit 36 at 28.

44. MWG acknowledges operating two CCR surface impoundments, the West Pond and the East Pond. *See* Pet. at 7. The Old Pond was operated in the same location as the West Pond and East Pond in addition to the 10-acre Grassy Field area to the west of the West Pond. *See* Agency Exhibit 45 at 13 and Agency Exhibit 33 at 23. The eastern two-thirds of Old Pond became the foundation material for the East and West Ponds. *See* Agency Exhibit 45 at 15. At least a portion of the CCR from Old Pond was incorporated into the berms of East and West Ponds as evidenced in the boring logs from monitoring wells MW1-MW5, which were drilled through the berms of the East and West Ponds. *See* Agency Ex. 46.

45. In addition, PERMIT 1977EB3699 contains construction notes stating that bottom ash slag "shall be used to construct the East and West Pond berms." *See* Agency Ex. 45 at 15. The Agency has found no information indicating that the bottom of Old Pond was lined, including the Grassy Field portion. Any CCR or CCR contaminated soils from Old Pond remaining under the synthetic liners of the East and West Ponds form the foundational subsoils of those

impoundments. The Grassy Field remains an unlined, inactive CCR surface impoundment as defined by 35 Ill. Adm. Code 845.120.

> ***35 Ill Adm. Code 104.406(e). A description of the efforts that would be necessary if the petitioner was to comply with the regulation of general applicability. All compliance alternatives, with the corresponding costs for each alternative, must be discussed. The discussion of costs must include the overall capital costs as well as the annualized capital and operating costs;***

46. Petitioner states that "[B]ecause the CCR Rule requirements are only applicable to depressions or excavations that receive CCR and liquid, they are not capable of being applied to the Grassy Field. *See* Pet. at 18. Petitioner's statement is incorrect. As described above, Grassy Field originated from Old Pond. See Agency Exhibit 45 at 13. Old Pond is an inactive CCR surface impoundment. Therefore, because Old Pond never closed under an Agency approved closure plan and Grassy Field sits within the within the footprint of Old Pond, Grassy Field is likewise an inactive CCR surface impoundment.

47. Petitioner provides various costs for the preparation of the required operating and construction permits, and the initial and annual fee. *See* Pet. at 19-20. While the Agency has not reviewed the amounts Petitioner approximates for these costs and fees, the Agency agrees these costs and fees are applicable as Grassy Field is an inactive CCR surface impoundment and subject to the requirements under Part 845.

> ***35 Ill Adm. Code 104.406(f)A narrative description of the proposed adjusted standard as well as proposed language for a Board order that would impose the standard. Efforts necessary to achieve this proposed standard and the corresponding costs must also be presented;***

48. Petitioner provides the following language for its requested adjusted standard:

> Part 845 of the Illinois Pollution Control Board Regulations does not apply to the 10-acre area west of the West Pond known as the Grassy Field located at the MWG Waukegan Generating Station, 401 East Greenwood Ave, Waukegan, IL 60087 because it is an unconsolidated fill area. MWG will continue to conduct quarterly groundwater monitoring of each monitoring well at the Waukegan

> Station for the constituents listed in 35 Ill. Adm. Code 620.410(a), with the exception of perchlorate, in the addition of field pH and static water elevation. MWG will report the analytical results and field measurements to the Agency quarterly. Two copies of the quarterly reports shall be submitted to:
>
> Groundwater Section
> Illinois Environmental Protection Agency
> Division of Public Water Supplies
> MC #13
> 1021 North Grand Avenue East
> Springfield, IL 62794-9276

Pet at 23. MWG reports that the agreed groundwater monitoring and reporting will cost $30,000 annually.

49. While MWG has been collecting dissolved groundwater monitoring results surrounding the West Pond and East Pond, from wells upgradient wells of those two CCR surface impoundments, (i.e. MW-05, MW-06 and MW-07), those monitoring wells are installed into the east, west, and south perimeter, respectively, of Grassy Field. While the wells are monitored as a part of a Compliance Commitment Agreement ("CCA") with the Agency, MW-05, which is on the east side of the Grassy Field and MW-07, which is southeast of Grassy Field, Pet. Ex. 12, report reoccurring concentrations of Boron, Sulfate and TDS that exceed the Part 845.600(a)(1) numerical groundwater protection standards, *See* Agency Exhibit 34. However, because the CCA was approved under Part 620 in 2012, all of the constituents in Section 845.600(a)(1) are not being monitored, nor are total metals being analyzed. Monitoring well MW-06 does not have detections of contaminants exceeding Section 845.600(a)(1) numerical groundwater protection standards as frequently as MW-05 or MW-07, but as displayed in Pet. Ex. 12, MW-06 is at best cross-gradient from Grassy Field, but is down gradient of MW-08, which has CCR identified in the well log. *See* Agency Exhibit. 46.

50. MWG relies on the Alternative Source Demonstration ("ASD") completed under the federal CCR rule to show that the East and West Ponds, which are the only CCR surface impoundments that MWG claims under Part 257, are not the source of contaminants in the groundwater. *See* Pet. Ex. 15. at 725 (pdf). The Agency has not evaluated the conclusions provided in the ASD, nor is U.S. EPA required to evaluate or approve ASDs under Part 257. The writer of the ASD must only certify that they have met the requirements of Part 257 for that evaluation. 80 Fed Reg 21487 (April 17, 2015). Though the Agency has not evaluated the ASD, the Agency does note that Pet. Ex. 15. at 729 (pdf), claims that exceedances of Ground Water Protection Standards ("GWPS") in MW-16 southeast of Grassy Field and West Pond, Pet. Ex. 12, have a source other than the East or West Ponds. The Petitioner doesn't deny that Grassy Field contains CCR, or that it is a readily identifiable source of CCR contaminants in groundwater. The Petitioner only contests that Grassy Field is a CCR surface impoundment. *See* Pet. at 10.

51. As discussed herein, Grassy Field meets the definition of a CCR surface impoundment, therefore Part 845 is applicable to the Grassy Field. Should the Board determine that Grassy Field is not a CCR surface impoundment and the Section 845.600 GWPS are not applicable, Part 620, groundwater quality standards would be appliable. There are exceedances of Section 620.410(a) standards down gradient of Grassy Field (e.g. Boron, Sulfate and TDS), therefore corrective action would be required. To date, the Agency is not aware of any actions voluntarily initiated by MWG to mitigate the release of contaminants from Grassy Field. Part 845 provides a detailed evaluation process for closure and corrective action, but Part 845 only applies to CCR surface impoundments.

> ***35 Ill Adm. Code 104.406(g) The quantitative and qualitative description of the impact of the petitioner's activity on the environment if the petitioner were to comply with the regulation of general applicability as compared to the quantitative and qualitative impact on the environment if the petitioner were to comply only with the proposed adjusted standard. To the extent applicable, cross-media impacts must be discussed. Also, the petitioner must compare the qualitative and quantitative nature of emissions, discharges***

> ***or releases that would be expected from compliance with the regulation of general applicability as opposed to that which would be expected from compliance with the proposed adjusted standard;***

52. Petitioner's assertion that application of Part 845 to the Old Pond will not have any more favorable environmental impact than exempting it from Part 845 is disingenuous. *See* Pet at 24. The Pollution Control Board has found that discharges from the Grassy Field/Old Pond and coal ash in fill areas have a negative environmental impact by contributing to water quality exceedances:

> The Board finds that the groundwater monitoring results indicate the Former slag and Fly Ash Storage area is the likely source of boron exceedances at Waukegan Station in the wells downgradient of the area as well as the ash ponds. The Board, thus, finds that the Environmental Groups have proven that it is more likely than not that coal ash stored onsite, either in the ash ponds or outside of the ponds is causing or contributing to these exceedances.

PCB 13-15 at 75.

> Therefore the Board finds that the likely source of the 57 exceedances of sulfate and 63 exceedances of TDS in the downgradient monitoring wells MW-5, 7, 8, and 9 at Waukegan is the Former Slag and Fly Ash Storage area located west of the ash ponds. The Board, thus finds that the Environmental Groups have proven that it is more likely than not that coal ash stored onsite, either in the ash ponds or outside of the ponds, is causing or contributing to these exceedances.

PCB 13-15 at 76.

53. As the Agency has explained the Grassy Field composes about one third of Old Pond, while the remaining two thirds has been incorporated into the berms of the East and West Ponds and forms the foundational subsoils below the synthetic liners in the East and West Ponds. *See* Agency Exhibit 45 at 15. The presence of CCR in Grassy Field and East and West Ponds, and exceedances of GWPS is consistent with the Board's findings.

54. As detailed in the Agency's Recommendation and supported by the referenced exhibits, Grassy Field is the remaining unlined, 10-acre CCR surface impoundment containing slag, bottom

ash and fly ash left after water treatment, in what was a much larger 30 acre Old Pond. The other 20-acres of Old Pond was incorporated into the berms and foundational subsoils of the West Pond and East Pond as shown in Agency exhibits. *See* Agency Exhibit 45 at 15.

35 Ill Adm. Code 104.406(h). A statement that explains how the petitioner seeks to justify, under the applicable level of justification, the proposed adjusted standard;

55. Illinois EPA agrees with Petitioner that because Part 845 does not specify a level of justification for an adjusted standard, the applicable level of justification are the factors identified in Section 28.1(c) of the Act. *See* Amd. Pet at 13. Section 28.1 of the Act provides:

> (1) factors relating to that petitioner are substantially and significantly different from the factors relied upon by the Board in adopting the general regulation applicable to that petitioner;
> (2) the existence of those factors justifies an adjusted standard;
> (3) the requested standard will not result in environmental or health effects substantially and significantly more adverse than the effects considered by the Board in adopting the rule general applicability; and
> (4) the adjusted standard is consistent with any applicable federal law.

56. The factors relating to Grassy Field have not been proven substantially and significantly different from the factors relied upon by the Board in adopting the Part 845 closure requirements applicable to West Pond and East Pond. In its adopting opinion, the Board stated, "These rules of general applicability provide for the protection of public health and the environment in Illinois." *See* R20-19 April 15, 2021 at 1. Because the Grassy Field is an inactive CCR surface impoundment and therefore subject to the rules of 845, Petitioner's request would not uphold the Board's intent to protect the public health and the environment in Illinois.

57. As explained herein, the requested adjusted standard will result in environmental or health effects. Grassy Field is an inactive surface impoundment that has never been closed by removal, nor has any type of low permeability cover been installed on top of it. The detection of CCR related constituents in excess of applicable groundwater protection standards show that Grassy Field presents the environmental and human health risks.

58. As further explained below, the requested adjusted standard is not consistent with or as protective as the federal CCR Rule (Part 257).

> ***35 Ill Adm. Code 104.406(i). A statement with supporting reasons that the Board may grant the proposed adjusted standard consistent with federal law. The petitioner must also inform the Board of all procedural requirements applicable to the Board's decision on the petition that are imposed by federal law and not required by this Subpart. Relevant regulatory and statutory authorities must be cited;***

59. Petitioner does not consider the Grassy Field to be regulated by Part 257. Part 257 is a self-implementing federal program, with no input from U.S. EPA on which units are properly classified as CCR surface impoundments. 80 Fed. Reg. 21309 (April 17, 2015), For this reason, the Board may grant the proposed adjusted standard consistent with federal law. However, Grassy Field *does* meet the definition of a CCR surface impoundment and should be regulated under Part 257 and Part 845. Section 845.100(b) states that any CCR surface impoundment failing to meet the requirements of this Part is an open dump and therefore prohibited under Section 21(a) of the Act. Similarly, 40 CFR, 257.100(a)(1) states that facilities failing to meet the requirements of Part 257 are open dumps. Therefore, Grassy Field must meet the requirements of Part 845 or it should be considered an open dump.

60. Therefore, for the above and foregoing reasons, Illinois EPA recommends that the Board DENY Petitioner’s request for a Board finding of inapplicability of Part 845.

II. WEST POND

61. MWG seeks an adjusted standard for the West Pond to allow the decontamination and retention of its existing liner rather than the liner's removal required for closure by removal provided in Section 845.740(a).

62. Pursuant to 35 Ill. Adm. Code 104.416(b), the Agency, at a minimum, "must address and respond to the petition with respect to each issue raised by the requirements of Section 104.406(a) through (j)." 35 Ill. Adm. Code 104.416(b).

> ***35 Ill Adm. Code 104.406(a). A statement describing the standard from which an adjusted standard is sought. This must include the Illinois Administrative Code citation to the regulation of general applicability imposing the standard as well as the effective date of that regulation;***

63. MWG requests an adjusted standard from 35 Ill. Adm. Code 845.740(a). This Section, along with the entirety of Part 845, became effective April 21, 2021. Section 845.740(a) states:

> Closure by Removal of CCR. An owner or operator may elect to close a CCR surface impoundment by removing all CCR and decontaminating all areas affected by releases of CCR from the CCR surface impoundment. CCR removal and decontamination of the CCR surface impoundment are complete when all CCR and CCR residues, containment system components such as the impoundment liner and contaminated subsoils, and CCR impoundment structures and ancillary equipment have been removed. Closure by removal must be completed before the completion of a groundwater corrective action under Subpart F.

See 35 Ill. Adm. Code 845.740(a).

> ***35 Ill Adm. Code 104.406(b). A statement that indicates whether the regulation of general applicability was promulgated to implement, in whole or in part, the requirements of the CWA (33 USC 1251 et seq.), Safe Drinking Water Act (42 USC 300(f) et seq.), Comprehensive Environmental Response, Compensation and Liability Act (42 USC 9601 et seq.), CAA (42 USC 7401 et seq.), or the State programs concerning RCRA, UIC, or NPDES (see 415 ILCS 5/28.1);***

64. Illinois EPA agrees with Petitioner, Part 845 implements Section 12, 22, and 22.59 of the Act.

35 Ill Adm. Code 104.406(c). The level of justification as well as other information or requirements necessary for an adjusted standard as specified by the regulation of general applicability or a statement that the regulation of general applicability does not specify a level of justification or other requirements;

65. The Agency agrees with Petitioner that Part 845 does not include a specific justification for an adjusted standard and therefore must follow the factors as laid out in Section 28.1 of the Act. *See* Amd. Pet at 5.

35 Ill Adm. Code 104.406(d). A description of the nature of the petitioner's activity that is the subject of the proposed adjusted standard. The description must include the location of, and area affected by, the petitioner's activity. This description must also include the number of persons employed by the petitioner's facility at issue, age of that facility, relevant pollution control equipment already in use, and the qualitative and quantitative description of the nature of emissions, discharges or releases currently generated by the petitioner's activity;

66. The Agency does not dispute the information provided by the Petitioner. *See* Pet. at 15. However, based on aerial photos and permits cited later herein, between the 1940's and 1970's the Waukegan Station used a single CCR surface impoundment ("Old Pond") to manage the fly ash and bottom ash produced at the station. In the late 1970's, Old Pond was converted into East Pond, West Pond, and Grassy Field. Grassy Field, the abandoned but not properly closed, is a portion of Old Pond that was not engineered into East and West Ponds.

35 Ill Adm. Code 104.406(e). A description of the efforts that would be necessary if the petitioner was to comply with the regulation of general applicability. All compliance alternatives, with the corresponding costs for each alternative, must be discussed. The discussion of costs must include the overall capital costs as well as the annualized capital and operating costs;

67. Petitioner seeks an adjusted standard from Section 845.740(a). To comply with the regulation of general applicability governing closure by removal, Petitioner would need to not only remove the HDPE liner, but also containment system components, including but not limited to contaminated subsoils. Following the completion of CCR removal and decontamination of the CCR surface impoundment under Section 845.740(a), Petitioner would need to submit to the

Agency a completion of CCR removal and decontamination report and a certification that CCR removal and decontamination of the CCR surface impoundment has been completed, both of which are subject to Agency approval. 35 Ill. Adm. Code §§ 845.740(e) and 845.760(f).

68. Petitioner states that requiring compliance with the closure by removal requirements would require MWG to choose one of two options: Option 1) build a new three-acre pond at a different on-site location or Option 2) excavation of the HDPE liner and "approximately six inches of soil below the liner. *See* Amd. Pet. at 8 and 9. Petitioner states Option 1, the new three-acre pond would cost approximately $1,373,000; and Option 2, the removal and replacement of the liner, would cost approximately $710,000. *See* Id. In addition, Petitioner states they have already spent approximately $2,548,351 to remove a majority of the CCR from the West Pond. *See* Amd. Pet at 7.

69. Petitioner's discussion of costs is misleading at best. The costs of compliance provided have not been completely evaluated. MWG states that they have spent $2,548,351, to remove the majority of CCR from the West Pond. *See* Pet. at 7. However, MWG contracts with third-parties to remove CCR for beneficial reuse. *See* Amd. Pet. at 6. Petitioner does not provide any information on offset in the removal costs, if any, due to this arrangement with third-parties. Neither does MWG provide any assessment of how the "majority" of CCR being removed for approximately $2.5 million compares with the amount of CCR left after a typical operational removal.

70. Second, the cost estimates provided by MWG are not accurate because MWG is comparing the cost of partial removal of contaminated materials (6 inches, Pet. Ex. 25) and installing a new synthetic liner in West Pond and a totally new, 3-acre low LVW pond. Based on well logs in the berms of West Pond, Agency Ex. 46, there are 14-16 feet of CCR in the berms of West Pond that

would have to be removed. That's approximately 30 times more contaminated material than MWG estimates. Assuming the same disposal costs per cubic yard assumed by Pet. Exhibit. 25, that's roughly $10 million to remove all contaminated soils, compared to about $1.4 million for a new LVW pond adequate to meet MWG's stormwater needs at the site.

71. The Petitioner further misdirects the cost estimates by equating the future use of an existing CCR surface impoundment as a low volume waste ("LVW") pond, with retrofitting a CCR surface impoundment, by implying that only cleaning and wipe samples would be necessary for that future use. *See* Pet. Ex 71. A LVW pond is not regulated under Part 845, while a retrofit CCR surface impoundment continues to be regulated under Part 845. At the end of its active life, a retrofit CCR surface impoundment must still close by removal or with a final cover. 35 Ill. Adm. Code 845.710. Calling West Pond a LVW pond would leave thousands of cubic yards of CCR in place, without a final cover system. Petitioner's discussion of costs does not address the existence of CCR material underneath the liner relevant to closure by removal under Part 845, or measures to remove or close with a final cover pursuant to Part 845 so as to include CCR material underlying the liner. Illinois EPA maintains that a closure by removal action must require removal of all contaminated components and impoundment structures, and subsoils, or a final cover system, neither of which are accounted for in Petitioner's discussion of costs. 35 Ill. Adm. Code 845.740.

72. Finally, Petitioner provides no estimated cost for groundwater remediation, which will be required to meet compliance with 415 ILCS 5/12(a) and (d), and 35 Ill. Adm Code 620, even if the Board allows the Petitioner to be unregulated by Part 845.

35 Ill Adm. Code 104.406(f)A narrative description of the proposed adjusted standard as well as proposed language for a Board order that would impose the standard. Efforts necessary to achieve this proposed standard and the corresponding costs must also be presented;

73. Petitioner proposes the following language for its requested adjusted standard:

> "MWG may close by removing and decontaminating all areas affected by releases from the West Pond at the Waukegan Station. CCR removal and decontamination of the West is complete when the CCR in the West Pond and any areas affected by releases from the CCR surface impoundment have been removed. MWG must conduct visual inspection and analytical testing to demonstrate that the geomembrane liner in the West Pond is not contaminated with CCR constituents. MWG must submit the results to Illinois EPA."

74. MWG's proposed adjusted standard attempts to equate decontamination of a competent synthetic liner prior to retrofit of a CCR surface impoundment under Section 845.770(a) with decontaminating a synthetic liner and calling it closure by removal under Section 845.740(a). These two processes however are very different. When retrofitting a CCR surface impoundment, a composite liner compliant with Section 845.400 will be placed over the top of the cleaned liner, thereby preventing liquids in the impoundment from migrating through the impoundment components and subbase material. The reused competent synthetic liner simply adds an additional layer of protection. At the end of its useful life a retrofit CCR surface impoundment must still be either closed by removal under Section 845.740(a) or closed in place under Section 845.750. When a retrofit CCR surface impoundment is closed by removal, the composite liner, reused synthetic liner, impoundment structures and components, and its original foundational subsoils must all be removed.

75. Allowing the Petitioner to certify as closed and decontaminated without removal of all the CCR surface impoundment components and contaminated subsoils circumvents these environmentally protective measures.

35 Ill Adm. Code 104.406(g) The quantitative and qualitative description of the impact of the petitioner's activity on the environment if the petitioner were to comply with the regulation of general applicability as compared to the quantitative and qualitative impact on the environment if the petitioner were to comply only with the proposed adjusted standard. To the extent applicable, cross-media impacts must be discussed. Also, the petitioner must compare the qualitative and quantitative nature of emissions, discharges or releases that would be expected from compliance with the regulation of general applicability as opposed to that which would be expected from compliance with the proposed adjusted standard;

76. Petitioner states "[A]llowing decontamination of a competent geomembrane liner has a more favorable environmental impact than removing and disposing the competent plastic liner and underlying soil. *See* Amd. Pet. at 12. In support, Petitioner states that the Board has found that reuse of a competent liner is acceptable for retrofitting a CCR surface impoundment. *Id*.

77. Retrofitting a CCR surface impoundment under Section 845.770 and closing a CCR surface impoundment under Section 845.740 are entirely different processes, with different purposes. The first requirement for retrofitting a CCR surface impoundment is that the synthetic liner must be competent. However, West Pond's liner may not be a competent liner. The Board has previously found "that the liners at Waukegan can and do crack or get damaged on occasions." PCB 13-15 at 66. The Board further concluded "that it is more likely than not that the ash ponds did leach contaminants into the groundwater." *Id.* Because the Board has found that the liners at Waukegan can and do crack and that the ponds leached contaminants into the groundwater, it is probable the West Pond's liner is not competent and should not be reused. Because the liners at Waukegan have allowed the leaching of contaminants into the groundwater, it is also likely to cause the subsoil to be contaminated.

78. In addition, aerial photographs from 2005 through 2021 were reviewed. *See* Agency Exhibits 13-26. Review of the sequential photographs and the Amended Petition indicating that West Pond was once again nearly empty, suggest that West Pond has been emptied no fewer

than four times since the liner was replaced in 2005. Petitioner's Exhibit 1 describes the process of removal of CCR from the impoundments. Machine operators specifically leave CCR in the bottom and on the sides of the impoundments to prevent damaging the liner by digging too deeply into the CCR during excavation. An aerial photo shows heavy equipment, a track hoe and semi-trailers being used in West Pond to remove CCR. *See* Agency Exhibit 36. The description states that an inspection is done to "verify that the ash was removed safely." *See* Pet. Ex. 1 at 39 (pdf). Since ash is left in place, "safe" ash removal cannot include a visual inspection of the liner to assess if the heavy equipment has caused tears or holes in the synthetic liner. The Petitioner does not indicate that any type of non-destructive liner testing has ever been completed since 2005.

79. Photographic evidence (*See* Agency Exhibits 13-26) and the Petitioner's own statements (*See* Amd. Pet. At 7) confirm that equipment has been operated on top of the synthetic liner for CCR removal at least four times. Each time equipment runs over the top of the synthetic liner the potential for damage exists. As can be seen in Agency Exhibit. 36, the trucks must use a ramp to get in and out of West Pond. This means hundreds of trips by heavily laden trucks has occurred across the liner in the area where trucks converge to use the ramp.

CONTAMINATED SUBSOIL COULD REMAIN ONSITE

80. It is likely that soil under the West Pond liner is contaminated because the pond has leached contaminants. The Board has previously found "that the liners at Waukegan can and do crack or get damaged on occasions." *Sierra Club, Environmental Law and Policy Center, Prairie Rivers Network, and Citizens Against Ruining the Environment v. Midwest Generation, LLC.* PCB 13-15 at 66 (June 20, 2019). The Board further concluded "that it is more likely than not that the ash ponds did leach contaminants into the groundwater." *Id.*

81. Closure by removal requires that contaminated subsoil be removed. 35 Ill. Adm Code 845.740(a) and 40 CFR 257.102(c). Allowing MWG to reuse the liner would authorize MWG to retain subsoil that is likely to be contaminated. As explained above, in the instance of the Waukegan West Pond, simply removing all the CCR and CCR contaminated material above the synthetic liner does not decontaminate the entire CCR unit. Therefore, such an action is contrary to both Part 257 and Part 845. MWG's decontamination plan would only decontaminate the top of the liner. MWG has not addressed how contaminated subsoils and impoundment structures under the liner could be removed while retaining the existing liner. By retaining the liner, it would not be feasible to remove the underlying subsoil and impoundment components that contain CCR.

82. If the Board grants the requested adjusted standard, Petitioner will avoid removing not only the HDPE liner, but also the contaminated subsoils or subgrade materials. If the liner and subsoils are not removed as part of West Pond's closure as a CCR surface impoundment under Part 845, then the materials could remain indefinity, because no other regulations specifically require their removal.

35 Ill Adm. Code 104.406(h). A statement that explains how the petitioner seeks to justify, under the applicable level of justification, the proposed adjusted standard;

83. Illinois EPA agrees with Petitioner that because Part 845 does not specify a level of justification for an adjusted standard, the applicable level of justification are the factors identified in Section 28.1(c) of the Act. *See* Amd. Pet at 13. Section 28.1 of the Act provides:

> (1) factors relating to that petitioner are substantially and significantly different from the factors relied upon by the Board in adopting the general regulation applicable to that petitioner;
> (2) the existence of those factors justifies an adjusted standard;
> (3) the requested standard will not result in environmental or health effects substantially and significantly more adverse than the effects considered by the Board in adopting the rule of general applicability; and
> (4) the adjusted standard is consistent with any applicable federal law.

See 415 ILCS 5/28.1.

84. Illinois EPA states the following regarding West Pond and the aforementioned factors: The factors relating to West Pond have not been proven substantially and significantly different from the factors relied upon by the Board in adopting the Part 845 closure requirements applicable to West Pond. In its adopting opinion, the Board stated, "These rules of general applicability provide for the protection of public health and the environment in Illinois." *See* R20-19, Final Order at 1 (April 15, 2021). Because the West Pond liner may not be competent and contaminated subsoil may remain on site, Petitioner is not upholding the Board's intent to protect the public health and the environment in Illinois.

85. Petitioner states that its proposed adjusted standard is justified because of the lack of environmental benefit in requiring removal of the HDPE liner in compliance with Section 845.740(a). Illinois EPA maintains that Petitioner's proposed adjusted standard is not justified because the West Pond liner may not be competent and contaminated subsoil may remain on site.

86. As explained above, the requested adjusted standard will result in environmental or health effects substantially more adverse than the effects addressed by the Board in adopting Part 845 closure requirements.

87. As further explained below, the requested adjusted standard is not consistent with or as protective as the federal CCR Rule, Part 257.

> ***35 Ill Adm. Code 104.406(i). A statement with supporting reasons that the Board may grant the proposed adjusted standard consistent with federal law. The petitioner must also inform the Board of all procedural requirements applicable to the Board's decision on the petition that are imposed by federal law and not required by this Subpart. Relevant regulatory and statutory authorities must be cited;***

88. Petitioner argues that the Agency modified closure requirement language of Section 845.740(a) during the rulemaking from the Federal language and the modification is not consistent with the corresponding Federal rule. *See* Pet. at 4 and 5.

89. The Agency did modify the proposed rule language during the rulemaking process. *In the Matter of: Standards for the Disposal of Coal Combustion Residuals in Surface Impoundments: Proposed New 35 Ill. Adm. Code 845*, PCB 20-19. The language of the regulation was modified to comport with the federal proposed language. U.S. EPA considers the language of the current Federal regulation and the proposed language to be essentially the same. 85 Fed. Reg., 12469 (March 3, 2020).

THE ADJUSTED STANDARD PETITION DOES NOT MEET FEDERAL CLOSURE BY REMOVAL REQUIREMENTS

90. The adjusted standard requested by the MWG is not consistent with the Federal closure by removal requirements. Petitioner proposes the following language for its requested adjusted standard:

> "MWG may close by removing and decontaminating all areas affected by releases from the West Pond at the Waukegan Station. CCR removal and decontamination of the West Pond is complete when the CCR in West Pond and any areas affected by releases from the CCR surface impoundment have been removed. MWG must conduct visual inspection and analytical testing to demonstrate that the geomembrane liner in West Pond is not contaminated with CCR constituents. MWG must submit the results to Illinois EPA."

91. Petitioner alleges that its proposed adjusted standard is consistent with federal law, stating that the applicable federal CCR rule and the United States Environmental Protection Agency's ("U.S. EPA") Part B proposal both allow for decontamination of a liner and do not require removal. Pet. at 13-14. Illinois EPA maintains that Petitioner misrepresents the federal closure by removal requirements and that the proposed adjusted standard is not consistent with federal law.

92. First, the requested adjusted standard is not consistent with Part 257's closure by removal requirements, which explicitly require decontamination of the CCR Unit, not just the liner, and also requires compliance with GWPS to complete closure by removal, as follows:

> "An owner or operator may elect to close a CCR unit by removing and decontaminating all areas affected by releases from the CCR unit. CCR removal and *decontamination of the CCR unit* are complete when constituent concentrations throughout the CCR unit and any areas affected by releases from the CCR unit have been removed and groundwater monitoring concentrations do not exceed the groundwater protection standard established pursuant to 257.95(h) for constituents listed in Appendix IV to this part."(Emphasis added).

40 CFR 257.102(c).

93. MWG cannot decontaminate the CCR Unit (West Pond) without removing the liner, because as explained herein the West Pond was constructed using CCR in the berms. Therefore, to decontaminate the CCR unit, all CCR would have to be removed from the berms and any other unit structures including the foundational subsoils. Further, the federal closure by removal standard requires that groundwater monitoring concentrations (all areas affected by releases from the CCR unit) not exceed GWPSs for Appendix IV constituents. 40 CFR 257.102(c). Arsenic and Lithium are Appendix IV constituents. 80 Fed. Reg. 21500 (April 17, 2015). Arsenic exceedances of GWPS down gradient of the West Pond have been reported by MWG in dissolved constituent monitoring conducted pursuant to a CCA. *See* Agency Exhibit 34. Total Arsenic and Lithium have not been monitored at Waukegan since November 2017 because MWG used a self-approved ASD under the federal rule to cease Appendix IV monitoring.[4] Importantly, groundwater monitoring results reported by MWG under the CCA show dissolved constituents Arsenic, Boron, Sulfate and TDS exceed the Part 845 GWPS down gradient of the West Pond. *See* Agency Exhibit. 34. Therefore,

[4] *See also* ASD discussion under Grassy Field applicability.

the adjusted standard proposed by MWG does not meet the federal closure by removal standard of meeting GWPS.

94. MWG's proposed adjusted standard makes no effort to comply with Part 845's requirement that liners be "competent" if they are to be reused. The proposed visual inspections and analytical testing in the proposed adjusted standard address only the decontamination of the existing liner, not its competence.

95. Furthermore, the Petitioner misrepresents the requirements of Part 257. Part 257 currently treats closure by removal and all associated corrective action as a single process, with closure not being considered complete until all corrective action, including groundwater remediation, has been completed. 40 CFR § 257.102(c). U.S. EPA states "once a facility has removed waste and the liner, the presumption is that the source of contamination has been removed as well." *Id*. Furthermore, U.S. EPA explains that part of attaining this performance standard is documentation that "any contaminants left in the subsoils (i.e. contaminated groundwater left in soils below the former landfill or impoundment) will not impact any environmental media including groundwater, surface water, or the atmosphere in excess of Agency-recommended limits or factors.... Once the facility has removed all the assessment monitoring constituents listed in Appendix IV down to background levels or MCLs, the groundwater is considered to be 'clean' and closure is complete." 80 Fed. Reg 21412 (Apr. 17, 2015). Clearly, U.S. EPA envisioned a comprehensive removal and corrective action process for a CCR surface impoundment to be considered closed by removal.

96. In March 2020, U.S. EPA proposed to divide closure by removal and corrective action requirements into two separate processes as part of a proposed rule known as "Part B." *See* proposed § 257.102(c). 85 Fed. Reg. 12477 (Mar. 3, 2020). U.S. EPA cited new information posted to facility CCR websites, including the number of CCR surface impoundments that are not lined

with any type of composite liner system (this includes West Pond), as evidence that groundwater corrective action would be more complex than previously understood and should therefore be separated from the closure by removal process. 85 Fed. Reg. at 12469 (Mar. 3, 2020).[5] Proposed 40 CFR § 257.102(c) provides that closure by removal activities include "removing and decontaminating all CCR and CCR residues, containment system components such as the unit liner, contaminated subsoils, contaminated groundwater, and CCR unit structures and ancillary equipment." 85 Fed. Reg. 12477 (March. 3, 2020). According to U.S. EPA, for a complete demonstration that all CCR has been removed from the unit, "any containment system components such as a bottom liner, contaminated subsoils, and unit structures and equipment . . . would have to be removed prior to closure of the unit." 85 Fed. Reg. 12477 (March. 3, 2020). If an owner or operator does not demonstrate compliance with GWPS, an owner or operator could qualify to separate corrective action from closure if it has initiated corrective action, such that all components of the remedy are in place and operating as intended. See proposed 40 CFR 257.102(c)(2); 85 Fed. Reg. 12477 (March. 3, 2020). While the Part B proposal may appear to require more than the current version of Part 257, U.S. EPA states: "EPA is not proposing any substantive revisions to the current closure standard when closing by removal of CCR under 257.102(c)… EPA is, however, proposing to present the current closure standard in a slightly revised format…" for purposes of accommodating separation of groundwater corrective action from the rest of the requirements. 85 Fed. Reg. at 12469. U.S. EPA's proposal to clarify the closure by removal requirements just reiterated its intention that the current version of 40 CFR 257.102(c)

[5] "Available information indicates more than 70 percent of all CCR surface impoundments subject to the CCR regulations currently have neither type of composite liner system. Given the number of unlined CCR units, many of which have already reported exceedances of the groundwater protection standards, it is now evident that many CCR units have released CCR constituents into the surrounding soils and groundwater. This means that the closure activity is simply not a matter of removing CCR from the unit, but instead will likely require significant undertaking to remediate impacted soil and groundwater in order to achieve the current CCR removal and decontamination standards."

requirements already include removal of unit liners and all contaminated CCR surface impoundment components and subsoils.

97. Agency Exhibit 45, at. 15. Drawing, Note 4, states "Dike construction shall utilize boiler bottom slag of acceptable fly ash content to the extent the material is readily available." Since both the West and East Ponds were constructed within the footprint of the then active Old Pond, bottom ash was readily available. The logs (*see* Agency Exhibit 46)for monitoring well MW-5 in the west embankment of the West Pond and MW-16 at the southeast corner of West Pond record the presence of cinders ("slag"), while the boring log for WS-GT-04 (*see* Agency Ex. 47 at 15), near MW-5 reports black bottom ash. Therefore, the well logs demonstrate bottom ash and slag were used to construct the berms.

98. In addition to the verified use of CCR to construct the West Pond berms, a synthetic liner was removed from the West Pond in 2005 and replaced with the currently existing HDPE synthetic liner. In the Amd. Pet at 9, MWG states, based on its own expert's opinion, that when a liner is removed it should be conservatively assumed that approximately six inches of soil beneath the liner will become contaminated and removal of that material would also be required to complete the closure process. Even if all of the CCR from Old Pond was removed from beneath West Pond when it was initially constructed with a synthetic liner (which has not been demonstrated), it should be assumed that the removal process in 2005 contaminated the subsoil beneath the current synthetic liner. Therefore, the berms have been demonstrated to be contaminated with CCR and subsoils of the West Pond are likely contaminated with CCR.

99. Therefore, for the above and foregoing reasons, Illinois EPA recommends that the Board DENY Petitioner's request for an adjusted standard from 35 Ill Adm. Code 845.740(a).

RECOMMENDATION

WHEREFORE, for the above and foregoing reasons Illinois EPA recommends that the Board DENY Petitioner's request for an adjusted standard from 845.740(a) and DENY Petitioner's request for a finding of inapplicability of Part 845.

Dated: October 31, 2022

Respectfully submitted,
ILLINOIS ENVIRONMENTAL PROTECTION AGENCY,

Respondent,

BY: /s/Sara Terranova
Sara Terranova

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CERTIFICATE OF SERVICE

I, the undersigned, on affirmation certify the following:

That I have electronically served the attached **ELECTRONIC NOTICE AND FILING** and **RECOMMENDATION OF THE ILLINOIS ENVIRONMENTAL PROTECTION AGENCY** upon those listed on the Service List before 4:30 p.m. on October 31, 2022.

ILLINOIS ENVIRONMENTAL
PROTECTION AGENCY

By:____/s/ Sara Terranova___
Sara Terranova
Assistant Counsel
Division of Legal Counsel

DATED: __10/31/2022__

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P.O. Box 19276
Springfield, IL 62794-9276
(217) 782-554
Sara.Terranova@Illinois.Gov

Illinois EPA's Exhibit List

Exhibit 1- Waukegan 1939 Aerial Photograph

Exhibit 2- Waukegan 1946 Aerial Photograph

Exhibit 3- Waukegan 1961 Aerial Photograph

Exhibit 4- Waukegan 1974 Aerial Photograph

Exhibit 5- Waukegan 1980 Aerial Photograph

****the Agency notes there are no Exhibit 6-12**

Exhibit 13- Waukegan 2005 April Aerial Photograph

Exhibit 14- Waukegan 2006 August Aerial Photograph

Exhibit 15- Waukegan 2007 August Aerial Photograph

Exhibit 16- Waukegan 2008 October Aerial Photograph

Exhibit 17- Waukegan 2009 October Aerial Photograph

Exhibit 18- Waukegan 2010 May Aerial Photograph

Exhibit 19- Waukegan 2011 November Aerial Photograph

Exhibit 20 -Waukegan 2013 April Aerial Photograph

Exhibit 21- Waukegan 2015 June Aerial Photograph

Exhibit 22- Waukegan 2016 June Aerial Photograph

Exhibit 23- Waukegan 2017 April Aerial Photograph

Exhibit 24- Waukegan 2018 July Aerial Photograph

Exhibit 25-Waukegan 2020 June Aerial Photograph

Exhibit 26- Waukegan 2021 March. Aerial Photograph

*** **the Agency notes there are no Exhibits 27-31**

Exhibit 32- 1974EB0346 Permit and Permit Record

Exhibit 33- 1977EB3699 Permit and Permit Record

Exhibit 34- 2nd Quarter 2022 Monitoring Report

Exhibit 35- 1974 13 IL0002259 Initial NPDES Permit

Exhibit 36- 1974 16 IL0002259 Permit Application Documents

Exhibit 37- 1976 13 IL0002259 NPDES Permit Mod

Exhibit 38- 1977ED02715 Permit and Permit Record

Exhibit 39- 1978 13 IL0002259 mod thermal limits

Exhibit 40- 1986EN1415 Permit and Permit Record

Exhibit 41- Drawing_1977EB3699 Drawings from Permit Record

Exhibit 42- ILR108767 NPDES General Permit

Exhibit 43- PCB 13-15 Comp ex 19D Com Ed Phase II Environmental Site Assessment

Exhibit 44- PCB 13-15 Comp ex 38 Com Ed Phase I Environmental Site Assessment

Exhibit 45- History of Construction

Exhibit 46- Monitoring wells

Exhibit 47 KPRG 2005 Geotechnical Investigation

Exhibit 48-2017 IL0002259 Permit

Exhibit 49 -2017 IL0002259 Permit Record

Exhibit 50- Waukegan Machinery Use Aerial Photograph

Electronic Filing: Received, Clerk's Office 10/31/2022

Exhibit

1

LakeCounty

N

Map Printed on 9/21/2021

Old Pond Location, Encompasses East Pond and West Pond as well.

Waukegan Station 1939

Illinois Environmental Protection Agency's Response to the NRG Petition for Adjusted Standard at Waukegan Station

NRG Petition for Adjusted Standard From 845.740(a) and Finding of Inapplicability for Waukegan Station

Illinois Environmental Protection Agency, Bureau of Water

Disclaimer: The selected feature may not occur anywhere in the current map extent. A Registered Land Surveyor should be consulted to determine the precise location of property boundaries on the ground. This map does not constitute a regulatory determination and is not a base for engineering design. This map is intended to be viewed and printed in color.

Electronic Filing: Received, Clerk's Office 10/31/2022

Exhibit

2

Lake County, Illinois

LakeCounty

N

Map Printed on 9/21/2021

Old Pond Location, Encompasses East Pond and West Pond as well.

Waukegan Station 1946

Illinois Environmental Protection Agency's Response to the NRG Petition for Adjusted Standard at Waukegan Station NRG Petition for Adjusted Standard

From 845.740(a) and Finding of Inapplicability for Waukegan Station

Illinois Environmental Protection Agency, Bureau of Water

Disclaimer: The selected feature may not occur anywhere in the current map extent. A Registered Land Surveyor should be consulted to determine the precise location of property boundaries on the ground. This map does not constitute a regulatory determination and is not a base for engineering design. This map is intended to be viewed and printed in color.

Electronic Filing: Received, Clerk's Office 10/31/2022

Exhibit

3

LakeCounty

N

Map Printed on 9/21/2021

Old Pond Location, Encompasses East Pond and West Pond as well.

Waukegan Station 1961

Illinois Environmental Protection Agency's Response to the NRG Petition for Adjusted Standard at Waukegan Station NRG Petition for Adjusted Standard From 845.740(a) and Finding of Inapplicability for Waukegan Station

Illinois Environmental Protection Agency, Bureau of Water

Disclaimer: The selected feature may not occur anywhere in the current map extent. A Registered Land Surveyor should be consulted to determine the precise location of property boundaries on the ground. This map does not constitute a regulatory determination and is not a base for engineering design. This map is intended to be viewed and printed in color.

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Exhibit

4

LakeCounty

Map Printed on 9/21/2021

Pond Location and Name

N

Waukegan Station 1974

Illinois Environmental Protection Agency's Response to the NRG Petition for Adjusted Standard at Waukegan Station

NRG Petition for Adjusted Standard From 845.740(a) and Finding of Inapplicability for Waukegan Station

Illinois Environmental Protection Agency, Bureau of Water

Disclaimer: The selected feature may not occur anywhere in the current map extent. A Registered Land Surveyor should be consulted to determine the precise location of property boundaries on the ground. This map does not constitute a regulatory determination and is not a base for engineering design. This map is intended to be viewed and printed in color.

Electronic Filing: Received, Clerk's Office 10/31/2022

Exhibit

5

LakeCounty

Map Printed on 9/21/2021

Pond Location and Name

N

Waukegan Station 1980

Illinois Environmental Protection Agency's Response to the NRG Petition for Adjusted Standard at Waukegan Station

NRG Petition for Adjusted Standard From 845.740(a) and Finding of Inapplicability for Waukegan Station

Illinois Environmental Protection Agency, Bureau of Water

Disclaimer: The selected feature may not occur anywhere in the current map extent. A Registered Land Surveyor should be consulted to determine the precise location of property boundaries on the ground. This map does not constitute a regulatory determination and is not a base for engineering design. This map is intended to be viewed and printed in color.

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Exhibit

13

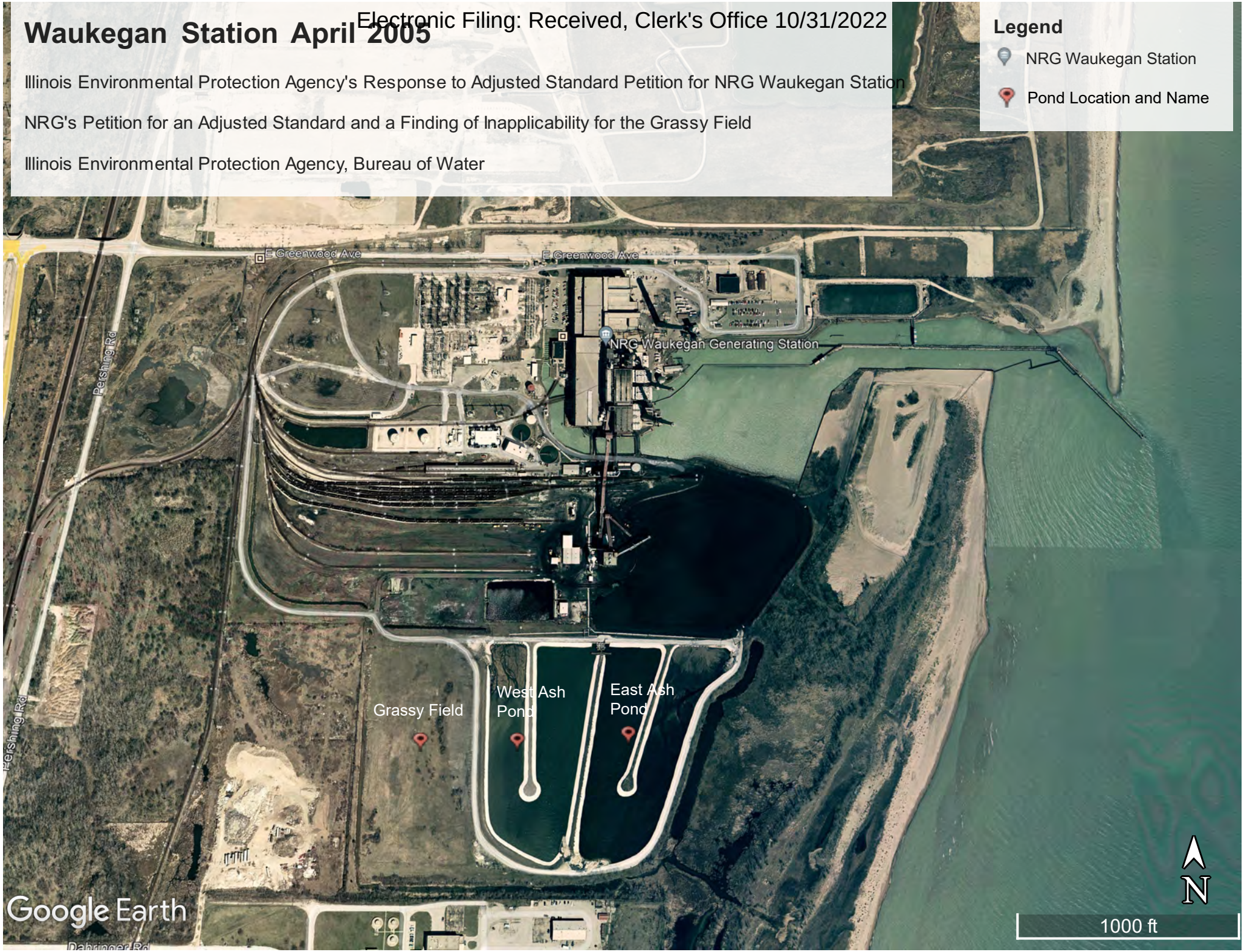
Electronic Filing: Received, Clerk's Office 10/31/2022

Waukegan Station April 2005

Illinois Environmental Protection Agency's Response to Adjusted Standard Petition for NRG Waukegan Station

NRG's Petition for an Adjusted Standard and a Finding of Inapplicability for the Grassy Field

Illinois Environmental Protection Agency, Bureau of Water



Electronic Filing: Received, Clerk's Office 10/31/2022

Exhibit

14

Electronic Filing: Received, Clerk's Office 10/31/2022

Waukegan Station August 2006

Illinois Environmental Protection Agency's Response to Adjusted Standard Petition for NRG Waukegan Station

NRG's Petition for an Adjusted Standard and a Finding of Inapplicability for the Grassy Field

Illinois Environmental Protection Agency, Bureau of Water

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Exhibit

15

Electronic Filing: Received, Clerk's Office 10/31/2022

Waukegan Station August 2007

Illinois Environmental Protection Agency's Response to Adjusted Standard Petition for NRG Waukegan Station

NRG's Petition for an Adjusted Standard and a Finding of Inapplicability for the Grassy Field

Illinois Environmental Protection Agency, Bureau of Water

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Exhibit

16

Electronic Filing: Received, Clerk's Office 10/31/2022

Waukegan Station October 2008

Illinois Environmental Protection Agency's Response to Adjusted Standard Petition for NRG Waukegan Station

NRG's Petition for an Adjusted Standard and a Finding of Inapplicability for the Grassy Field

Illinois Environmental Protection Agency, Bureau of Water

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Exhibit

17

Electronic Filing: Received, Clerk's Office 10/31/2022

NRG Waukegan Station October 2009

Illinois Environmental Protection Agency's Response to Adjusted Standard Petition for NRG Waukegan Station

NRG's Petition for an Adjusted Standard and a Finding of Inapplicability for the Grassy Field

Illinois Environmental Protection Agency, Bureau of Water

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Exhibit

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Electronic Filing: Received, Clerk's Office 10/31/2022

Waukegan Station May 2010

Illinois Environmental Protection Agency's Response to Adjusted Standard Petition for NRG Waukegan Station

NRG's Petition for an Adjusted Standard and a Finding of Inapplicability for the Grassy Field

Illinois Environmental Protection Agency, Bureau of Water

Electronic Filing: Received, Clerk's Office 10/31/2022

Exhibit

19

Electronic Filing: Received, Clerk's Office 10/31/2022

Waukegan Station November 2011

Illinois Environmental Protection Agency's Response to Adjusted Standard Petition for NRG Waukegan Station

NRG's Petition for an Adjusted Standard and a Finding of Inapplicability for the Grassy Field

Illinois Environmental Protection Agency, Bureau of Water

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Electronic Filing: Received, Clerk's Office 10/31/2022

Waukegan Station April 2013

Illinois Environmental Protection Agency's Response to Adjusted Standard Petition for NRG Waukegan Station

NRG's Petition for an Adjusted Standard and a Finding of Inapplicability for the Grassy Field

Illinois Environmental Protection Agency, Bureau of Water

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Exhibit

21

Electronic Filing: Received, Clerk's Office 10/31/2022

Waukegan Station June 2015

Illinois Environmental Protection Agency's Response to Adjusted Standard Petition for NRG Waukegan Station

NRG's Petition for an Adjusted Standard and a Finding of Inapplicability for the Grassy Field

Illinois Environmental Protection Agency, Bureau of Water

Electronic Filing: Received, Clerk's Office 10/31/2022

Exhibit

22

Electronic Filing: Received, Clerk's Office 10/31/2022

NRG Waukegan Station June 2016

Illinois Environmental Protection Agency's Response to Adjusted Standard Petition for NRG Waukegan Station

NRG's Petition for an Adjusted Standard and a Finding of Inapplicability for the Grassy Field

Illinois Environmental Protection Agency, Bureau of Water

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Exhibit

23

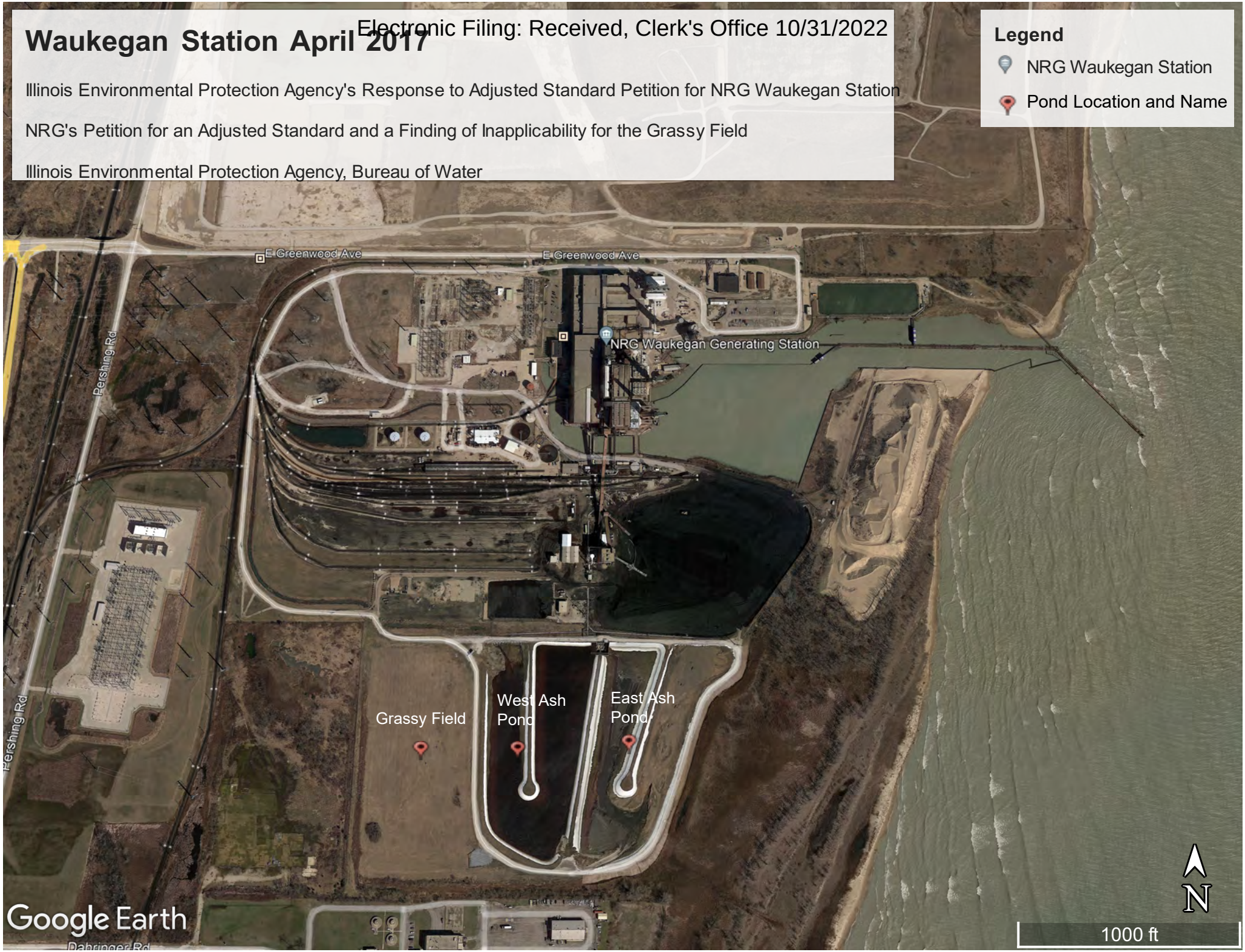
Electronic Filing: Received, Clerk's Office 10/31/2022

Waukegan Station April 2017

Illinois Environmental Protection Agency's Response to Adjusted Standard Petition for NRG Waukegan Station

NRG's Petition for an Adjusted Standard and a Finding of Inapplicability for the Grassy Field

Illinois Environmental Protection Agency, Bureau of Water



Electronic Filing: Received, Clerk's Office 10/31/2022

Exhibit

24

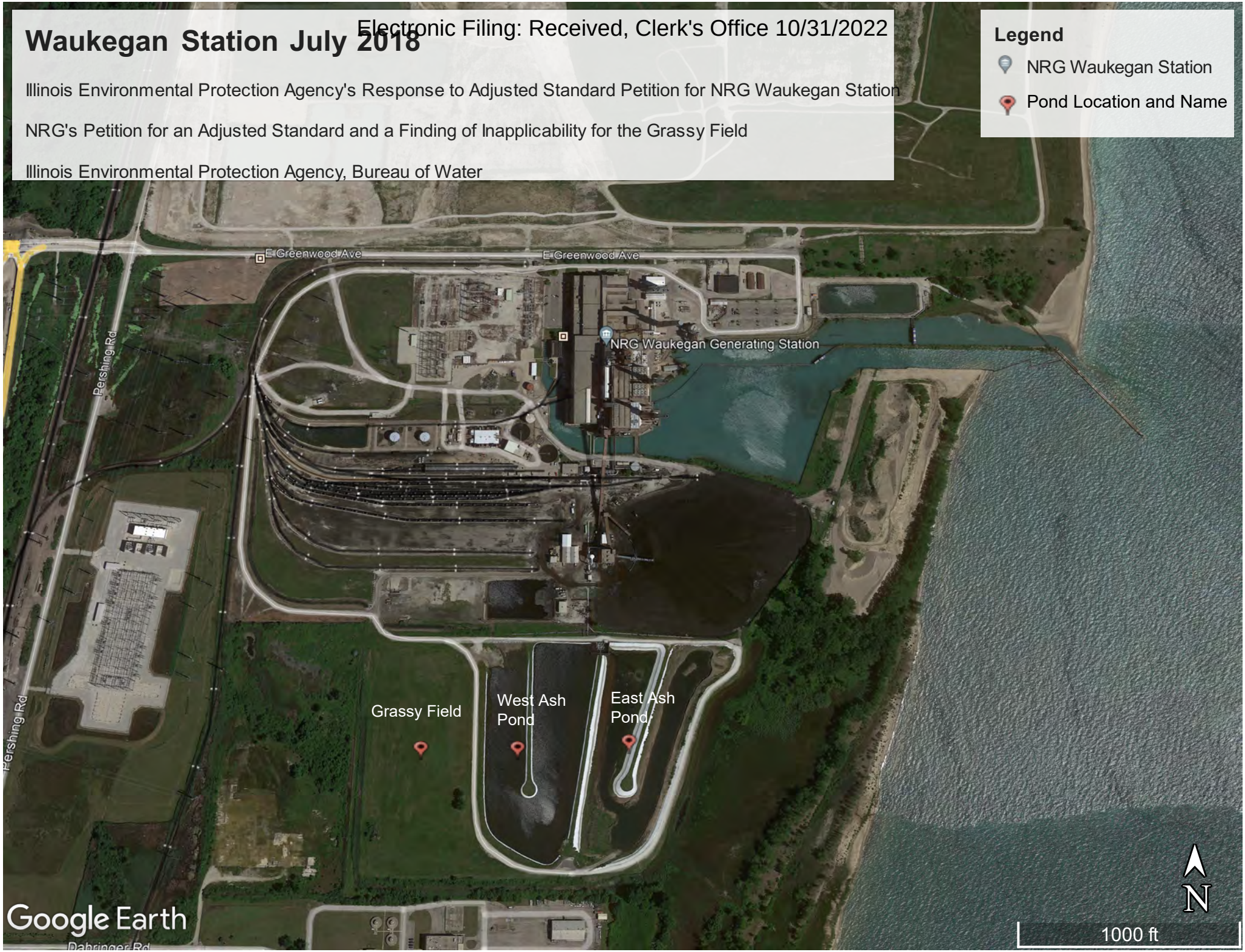
Electronic Filing: Received, Clerk's Office 10/31/2022

Waukegan Station July 2018

Illinois Environmental Protection Agency's Response to Adjusted Standard Petition for NRG Waukegan Station

NRG's Petition for an Adjusted Standard and a Finding of Inapplicability for the Grassy Field

Illinois Environmental Protection Agency, Bureau of Water



Electronic Filing: Received, Clerk's Office 10/31/2022

Exhibit

25

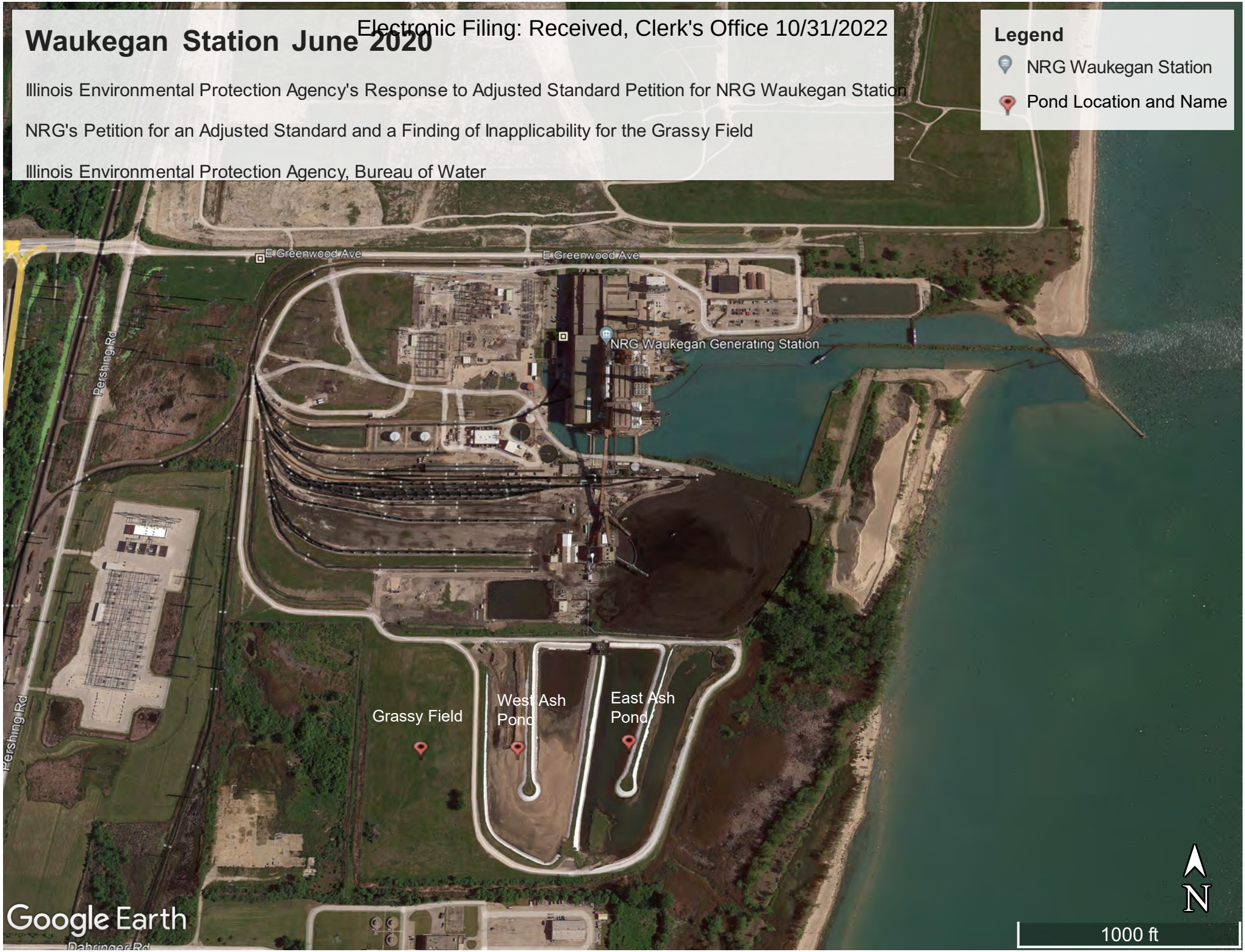
Electronic Filing: Received, Clerk's Office 10/31/2022

Waukegan Station June 2020

Illinois Environmental Protection Agency's Response to Adjusted Standard Petition for NRG Waukegan Station

NRG's Petition for an Adjusted Standard and a Finding of Inapplicability for the Grassy Field

Illinois Environmental Protection Agency, Bureau of Water



Electronic Filing: Received, Clerk's Office 10/31/2022

Exhibit

26

Electronic Filing: Received, Clerk's Office 10/31/2022

NRG Waukegan Station March 2021

Illinois Environmental Protection Agency's Response to Adjusted Standard Petition for NRG Waukegan Station

NRG's Petition for an Adjusted Standard and a Finding of Inapplicability for the Grassy Field

Illinois Environmental Protection Agency, Bureau of Water

Electronic Filing: Received, Clerk's Office 10/31/2022

Exhibit

32

W0971900500A COM ED-WAUK OPER PERMIT EXP2/28/77 03 1974EB0346 1 [S]

Electronic Filing - Received, Clerk's Office, 12/21/2009

Electronic Filing: Received, Clerk's Office 10/31/2022

PERMIT/PLAN/SPECIFICATION
MICROFILM "JACKET" INFORMATION

1. Division Code W
2. FIPS County Code 097
3. City/Township Code 190
4. Governing Body Code 0500A
5. PERMITTEE NAME (File Subject)

COM_ED-WAUK_OPER_PERMIT_EXP 2/28/77

6. File Division 03
7. IEPA Permit Number 1974EB0346

CROSS-REFERENCE INFORMATION

8. Governing Body Name

COMMONWEALTH_EDISON_COMPANY

9. ~~F/S/P Code~~ B0133
10. NPDES Number IL00

DWPC Records Unit

IL 532-0486
ADM 1081 8/78

Electronically Received Clerk's Office 10/31/2022

ILLINOIS ENVIRONMENTAL PROTECTION AGENCY
WATER POLLUTION CONTROL PERMIT

PERMIT NUMBER: 1974-EB-346-OP

DATE ISSUED: March 14, 1974
PROJECT LOG NUMBERS: 3603-72, 502-73, 4353-73

SUBJECT: COMMONWEALTH EDISON COMPANY, Waukegan Generating Station
(Lake County) - Operating Permit

154106

file

TO OWN AND OPERATE:
Commonwealth Edison Company
P.O. Box 767
Chicago, Illinois 60690

COPY COPY COPY

Permit is hereby granted to the above designated permittee to own and operate water pollution control facilities described as follows: slag field and settling basin which discharge an average of 4770 gpm to an unnamed ditch tributary to Lake Michigan.

The final plans, specifications and supporting documents approved by this permit were prepared by Sargent and Lundy and are identified in the records of the Illinois Environmental Protection Agency, Division of Water Pollution Control, Permit Section, by the log numbers designated for the subject heading above.

This permit expires on February 28, 1977.

The Standard Conditions of issuance of this permit are itemized below. Special Conditions applicable are itemized on the attached sheet.

READ ALL CONDITIONS CAREFULLY:

STANDARD CONDITIONS

Pertaining to both construction and operation permits:

1. If any statement or representation is found to be incorrect, this permit may be revoked and the permittee thereupon waives all rights thereunder.

2. During or after the construction or the installation of the sewage works, any agent duly authorized by the Environmental Protection Agency shall have the right to inspect such work and its operation.

3. The issuance of this permit (a) shall not be considered as in any manner affecting the title of the premises upon which the sewage works are to be located; (b) does not release the permittee from any liability for damage to person or property caused by or resulting from the installation, maintenance or operation of the proposed sewage works; (c) does not take into consideration the structural stability of any units or parts of the project; and (d) does not release the permittee from compliance with other applicable statutes of the State of Illinois, or with applicable local laws, regulations or ordinances.

4. Treatment works will be operated or supervised by a duly qualified sewage works operator certified under the Regulations of the Environmental Protection Agency.

5. The treatment works or wastewater source covered by this permit shall be constructed and operated in compliance with the provision of the Environmental Protection Act and Chapter 3 of the Rules and Regulations as adopted by the Illinois Pollution Control Board.

6. Plans, specifications and other documentation submitted shall constitute a part of the application and when approved shall constitute part of the permit.

7. This Permit may not be assigned or transferred without a new permit from the Illinois Environmental Protection Agency.

Pertaining only to construction permits.

1. There shall be no deviations from the approved plans and specifications unless revised plans, specifications, and application shall first have been submitted to the Environmental Protection Agency and a supplemental written permit issued.

2. The installation shall be made under the supervision of an inspector, who is familiar with the approved plans and specifications provided by and approved by the owner, and said inspector shall require that construction complies with the plans and specifications approved by this Agency.

3. Unless otherwise stated by Special Condition, construction must be completed in three years for treatment works and two years for sewers and wastewater sources.

4. Unless otherwise stated by Special Condition, the issuance of this permit shall be a joint construction and operation permit provided that:

a) All standard and Special Conditions are complied with.

b) This Agency is notified within ten (10) days, respectively, of the start of construction and the date of testing and start-up of full operation.

c) The submission of operating reports of the treatment works covered under this permit shall be at a frequency specified by this Agency.

d) The operation permit shall expire one year from the date of start-up of operation.

e) At least 90 days prior to the expiration date of the operation permit, the permittee shall apply for a renewal of the operation permit.

This permit is issued in accordance with the Illinois Environmental Protection Act of 1970 and the Chapter III Water Pollution Regulations adopted by the Illinois Pollution Control Board in March of 1972.

CES:WHB:jl
cc - EPA, Permit Section, Chicago
Lake County Health Department
Sargent and Lundy

DIVISION OF WATER POLLUTION CONTROL

William H. Busch

William H. Busch, P.E.

Electronic Filing, Received, Clerk's Office 10/31/2022

COMMONWEALTH EDISON COMPANY - Waukegan Generating Station
(Lake County) - Operating Permit
- Log #4553-73
- Permit #1974-EB-346-OP

SPECIAL CONDITION:

This Permit is for the slag field and settling basin discharge only and does not include the cooling water discharge.

S. (Treatment works only)

effluent standard are 4 mg/l of BOD_5 and 5 mg/l of suspended solids.

William H. Busch

Electronic Filing: Received, Clerk's Office 10/31/2022

STATE OF ILLINOIS
ENVIRONMENTAL PROTECTION AGENCY

Subject: Commonwealth Edison Co. - Waukegan Generating Station - OP
Log # 4553-73
Reviewed by: Louis Kollias Date: 2-22-73

Applicant: Commonwealth Edison Company
P.O. Box 767
Chicago, Illinois 60690

Engineer: Sargent and Lundy
140 S. Dearborn St.
Chicago, Illinois 60603

Documents Submitted: 8 Sheets of Plans
Application for Permit
Supplement to Application

Proposed: Discharge of the settling basin (slag field) which consists of the ash sluice water from the boilers and associated ash handling equipment, the demineralizer reagenerative waste water, and the demineralizer filter backwash water.

Receiving Stream: Unnamed ditch tributary to Lake Michig.

Meets the effluent and water quality standards very easily.

Will issue permit for 3 years.

Electronic Filing: Received, Clerk's Office 10/31/2022

FOR EPA USE: Log # Received Permit Number Date

File Subject

Richard B. Ogilvie
Governor

STATE OF ILLINOIS
ENVIRONMENTAL PROTECTION AGENCY
Division of Water Pollution Control
Permit Section
Springfield, Illinois 62706

William L. Blaser
Director

RECEIVED
DEC 28 1972 3603-72

ENVIRONMENTAL PROTECTION AGENCY
STATE OF ILLINOIS

APPLICATION FOR PERMIT
FOR
TREATMENT WORKS OR WASTEWATER SOURCES

(Read Instruction Booklet Before Completing)

PART II - APPLICATION FOR OPERATING PERMIT

SECTION I - General Information

1. Name of Facility WAUKEGAN GENERATING STATION

2. Owner's Name and Address COMMONWEALTH [illegible]SON COMPANY
(Name)
P.O. BOX 767 (Street) CHICAGO, ILLINOIS (City, State) 60690 (Zip Code)

3. Plant Mailing Address WAUKEGAN STATION, GREENWOOD & LAKE MICHIGAN (Street) WAUKEGAN, ILL. (City) (State) 60085 (Zip Code)

4. County LAKE

5. Engineer [signature] (Name) 27144 (Illinois Registration Number)

Firm SARGENT & LUNDY ENGINEERS

Address 140 SOUTH DEARBORN (Street) CHICAGO, ILLINOIS (City, State) 60603 (Zip Code)

Telephone 312 (Area Code) FI-6-7600 (Number)

6. Construction permit issued for the construction, additions, modifications, and upgrading of this treatment works or wastewater source. See list page 4.1, Part I

7. List previous operation permits issued for this facility after July 1, 1972.

NONE

8. Date that treatment works or wastewater source started operation, using all facilities currently at plant July 2, 1962 *

9. Name of certified operator in charge of this facility N/A

* This is the service date for the last generating unit installed (Unit #8) and does not apply to the treatment facilities constructed or modified after this date.

SECTION II - Effluent Data N/A

1. Approved Loadings (Design)

   a. Gallons Per Day _____ GPD

   b. Pounds of BOD Per Day _____ Lbs BOD/Day

   c. Pounds Suspended Solids Per Day _____ Lbs SS/Day

   d. Population Equivalent (at .17 lb BOD/P.E. _____ P.E.

2. Current Loadings N/A

   a. Gallons Per Day _____ GPD

   b. Influent BOD Concentration _____ mg/l

   c. Pounds of BOD Per Day _____ Lbs BOD/Day

   d. Influent Suspended Solids Concentration _____ mg/l

   e. Pounds Suspended Solids Per Day _____ Lbs. SS/Day

   f. Population Equivalent(at .17 lb BOD/P.E. _____ P.E.

3. History of Flows

   N/A

	Year	Flow
(a)	_____	_____ MGD
	_____	_____ MGD
	_____	_____ MGD
	_____	_____ MGD

   (b) Graph of Flows (Last 12 Months)

4. Excess flows N/A

   a. Number of times which flow was bypassed to excess flow treatment or bypassed raw to the waters of the State for as long as data is available _____ Times

   b. Length of time that above data covers _____ Years _____ Months

Electronic Filing: Received, Clerk's Office 10/31/2022

c. Average amount of flow bypassed each time N/A Million Gallons

d. Maximum amount of flow bypassed during single bypassing period N/A Million Gallons

5. i) Discharge #1 (main station cooling water discharge)

Chemical Constituents in mg/liter except pH	a	b	c Intake*	d Discharge **
Ammonia Nitrogen (as N)			.11	None Added
Arsenic (Total)		(3)	.04	"
Barium		(2)	.07	"
Boron (Total)		(3)	1.0	"
Cadmium (Total)		(3)	.003	"
Chloride			10	12
Carbon Chloroform Extract		Not	Sampled	***
Chromium (Total Hexavalent)		TOTAL	.004	None Added
Chromium (Total Trivalent)				
Copper (Total)		(3)	.04	None Added
Cyanide		Not	Sampled	"
Flouride		Not	Sampled	"
Iron (Total) All iron assumed dissolved			.420	"
Iron (Dissolved)				
Lead (Total)		(3)	.026	None Added
Manganese (Total)		(2)	.008	"
Mercury (Total)		(3)	.0003	"
Nickel (Total)		(3)	.02	"
Oil (Hexane Soluables or Equivalent)		Not	Sampled	***
pH	Range		7.8-8.2	7.8-8.2
Phenols		Not	Sampled	None Added
Phosphorous (as P)			.2	.2
Selenium (Total)		(3)	< .03	None Added
Silver		(2)	< .001	"
Sulfate			21.5	24.2
Total Dissolved Solids			175	180
Zinc (Total)			.026	None Added
Dissolved Oxygen			Not Sampled	Not Significant Decrease expected

* Average of forty samples taken during typical operating days. The numbers in the parenthesis to the left of this column indicate the number of samples averaged when forty samples were not available.

** Calculated maximum concentrations. (See page 4 of the attached supplement for the average concentrations and details).

*** May be an incidental trace.

Electronic Filing: Received, Clerk's Office 10/31/2022

5. ii) Discharge #2 (slag field and settling basin discharge)

Chemical Constituents in mg/liter except pH	a	b	c Intake*	d Discharge **
Ammonia Nitrogen (as N)			.11	.10
Arsenic (Total)		(3)	.04	< .05
Barium		(2)	.07	.21
Boron (Total)		(3)	1.0	4.0
Cadmium (Total)		(3)	.003	.009
Chloride			10	29†
Carbon Chloroform Extract		Not	Sampled	***
Chromium (Total Hexavalent)	}	TOTAL	.004	.008
Chromium (Total Trivalent)	}			
Copper (Total)		(3)	.061	.022
Cyanide		Not	Sampled	None Added
Flouride			.5	.5
Iron (Total) Assume all iron dissolved			420	1.1
Iron (Dissolved)				
Lead (Total)		(3)	.02	.03
Manganese (Total)		(2)	.004	.17
Mercury (Total)		(3)	.0003	.0002
Nickel (Total)		(3)	.06	.05
Oil (Hexane Soluables or Equivalent)		Not	Sampled	***
pH (Range)			7.8-8.2	8.3†
Phenols		Not	Sampled	None Added
Phosphorous (as P)			.20	.04 †
Selenium (Total)		(3)	< .03	< .03
Silver		(3)	< .001	< .002
Sulfate			21.5	163 †
Total Dissolved Solids			175	408 †
Zinc (Total)			.026	.058
Dissolved Oxygen			10.9	7.0 (minimum)

* Average of forty samples taken during typical operating days. The numbers in the parenthesis to the left of this column indicate the number of samples averaged when forty samples were not available.

** Maximum of three samples taken during normal operation.

† Maximum of eleven monthly samples taken during normal operation for the period September 1971 through August 1972 (See page 6 of the attached supplement for the average concentrations and details).

*** May be an incidental trace.

Electronic Filing: Received, Clerk's Office 10/31/2022

SECTION III - Non-contact Cooling Water

1. Source of Water Intake Lake Michigan

2. Discharge Quantities (Average of Last Year)

Discharge #1

	Minimum	Average	Maximum
Flow (MGD)	161.3	1036.8	1036.8
Intake Temperature (°F)*	32	52	72
Discharge Temperature (°F)*	38	61	84

3. Does maximum discharge temperature normally occur at times of maximum discharge flow?
(Yes) No (Circle) If no, explain.

*Intake and discharge temperatures are based on the plant record for December 1971 - November 1972 period. In our engineering judgement the discharge will meet the applicable thermal standards at the edge of the maximum allowable mixing zone, after the completion of the proposed alteration of the discharge structure (See page 2 of the attached supplement for details).

SECTION V - Signature by Engineer

I hereby certify to the best of my knowledge that the information contained in this application is true and correct.

Date 12/22/1972 Signature _____ (Seal)

Certificate by Applicant

I hereby certify to the best of my knowledge that the information submitted is true and correct and the facility for which this permit is applied is being operated in compliance with all Standard and Special Conditions listed on the Construction Permit issued for this facility. I further agree that this Application for Permit shall not constitute a Permit until signed by the Manager of the Permit Section, Division of Water Pollution Control.

Commonwealth Edison Co.

Date 12/22/72 Signature of Applicant _____

L. F. Lischer

Title Vice-President

Approval by Illinois Environmental Protection Agency

Permit Number _____

Date _____

This Permit Expires _____

_____

Manager
Permit Section
Division of Water Pollution Control

Electronic Filing: Received, Clerk's Office 10/31/2022

Concentrations of Dissolved Iron in the Discharge from Slag Field (Settling Basin) and Station Intake

Waukegan Generating Station
Commonwealth Edison Company

Date	Dissolved Fe (mg/l) Slagfield Discharge	Station Intake
2-2-73	0.16	0.33
2-6-73	0.27	0.44
2-9-73	0.16	0.27
2-13-73	0.19	0.46
2-26-73	0.05	0.27
3-15-73	< 0.01	0.02
4-19-73	0.04	0.04
5-12-73	< 0.02	0.05
6-11-73	0.08	< 0.02
7-06-73	0.15	0.18
8-06-73	< 0.02	< 0.02
9-05-73	0.03	< 0.01
10-10-73	0.05	0.03
10-30-73	0.03	0.04
12-3-73	0.08	0.14
12-7-73	0.16	0.26

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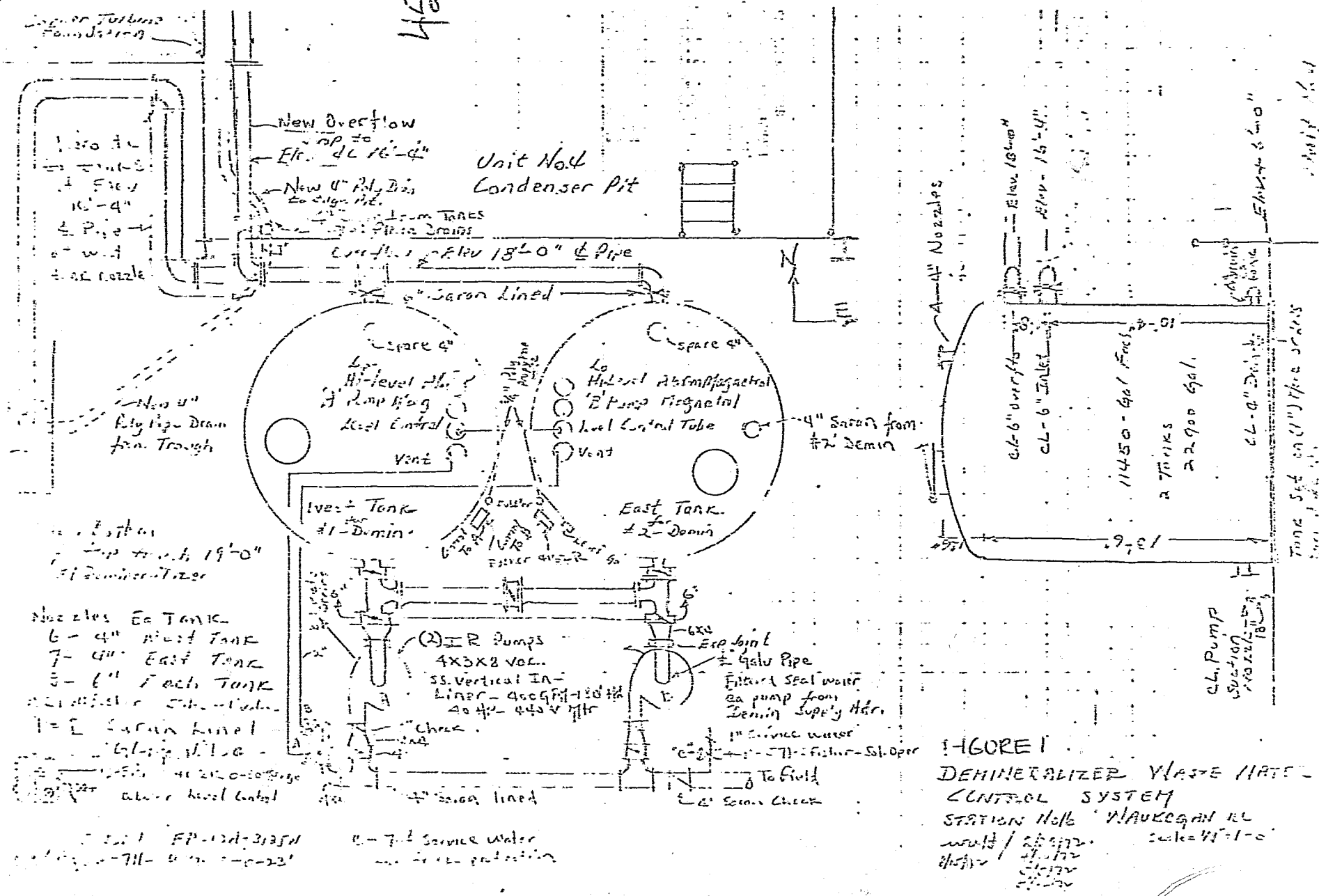
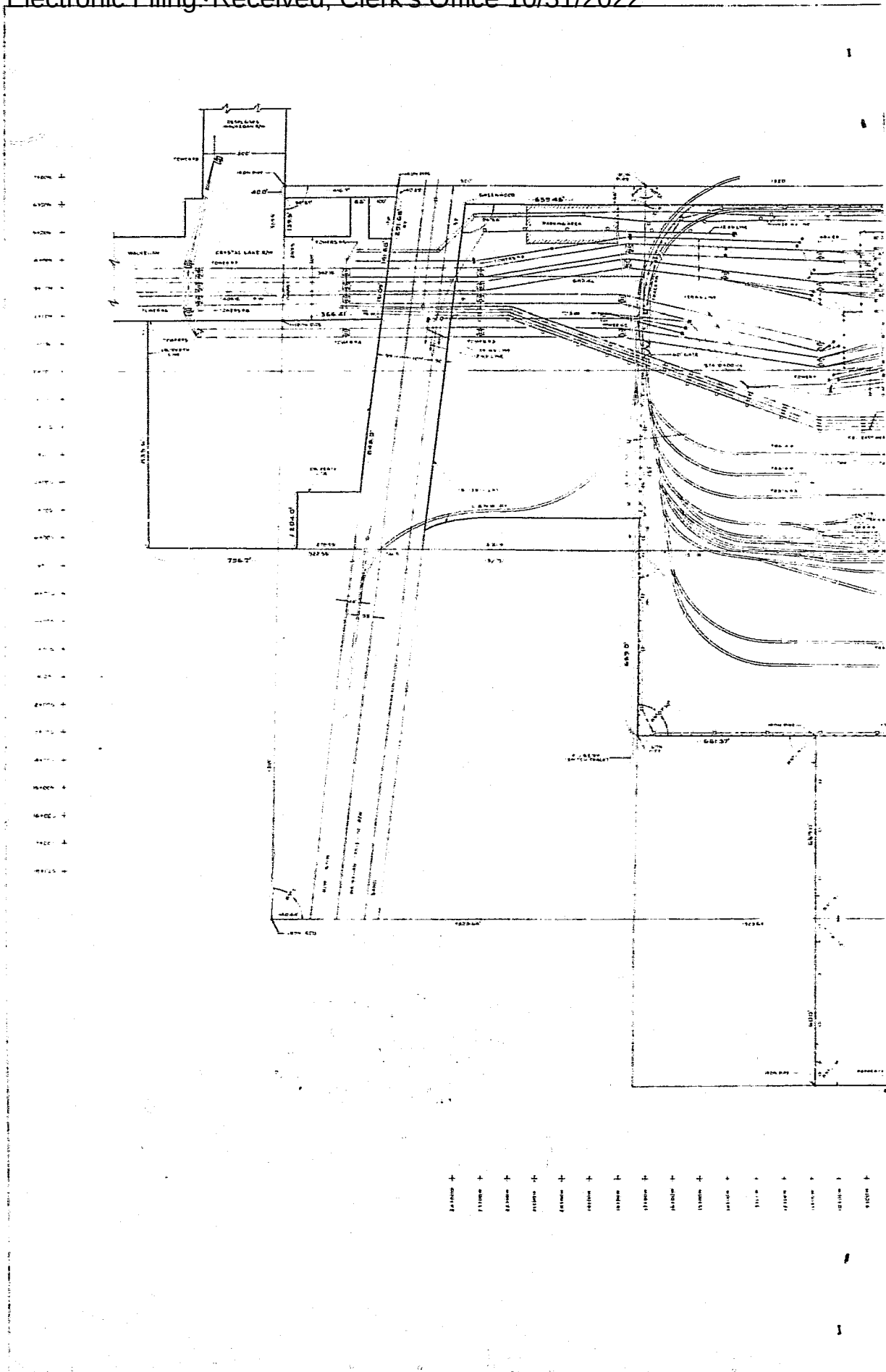
PCB 2023-154





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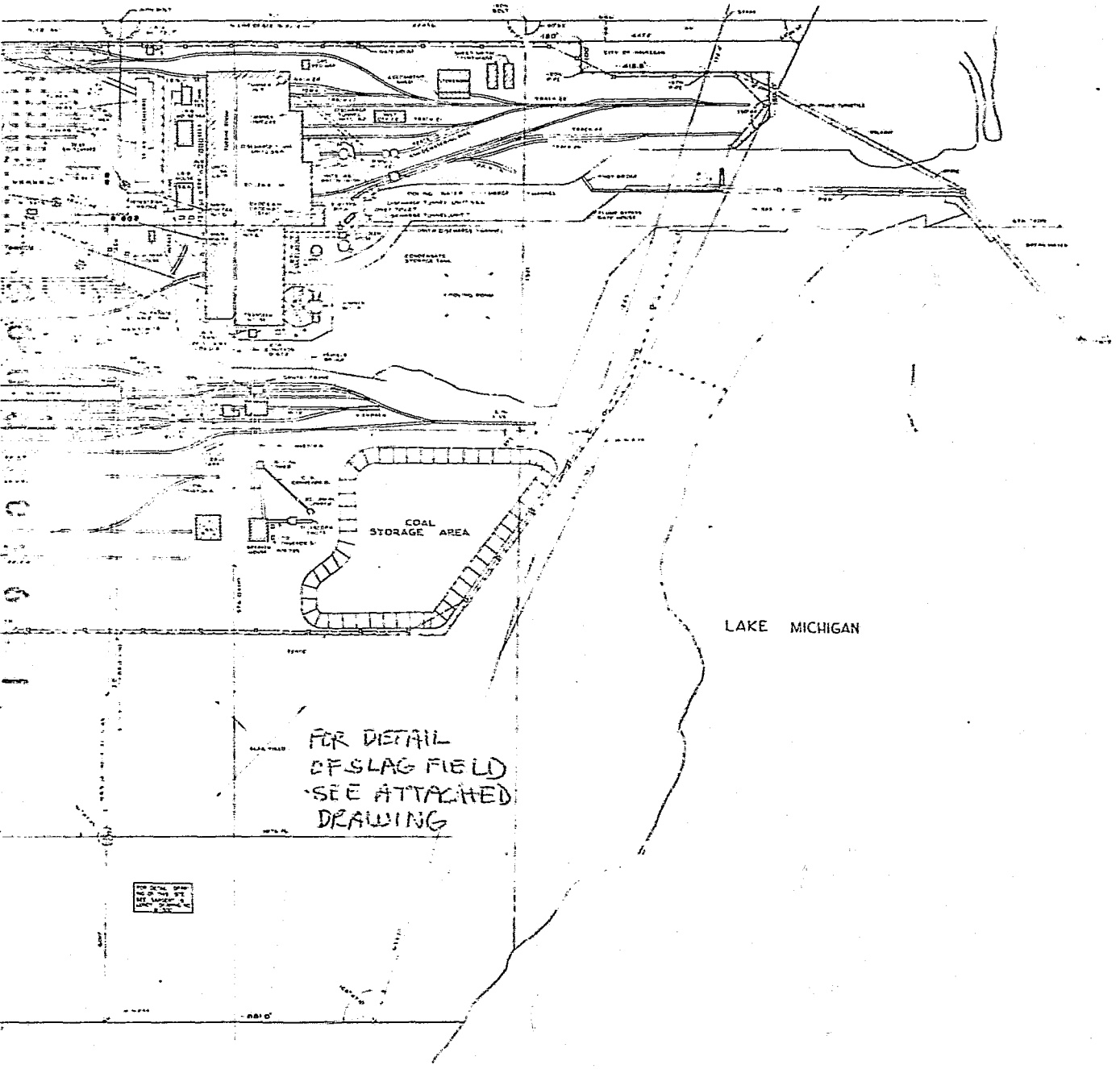

WAUKEGAN STATION

FIGURE 2

RE 3-7

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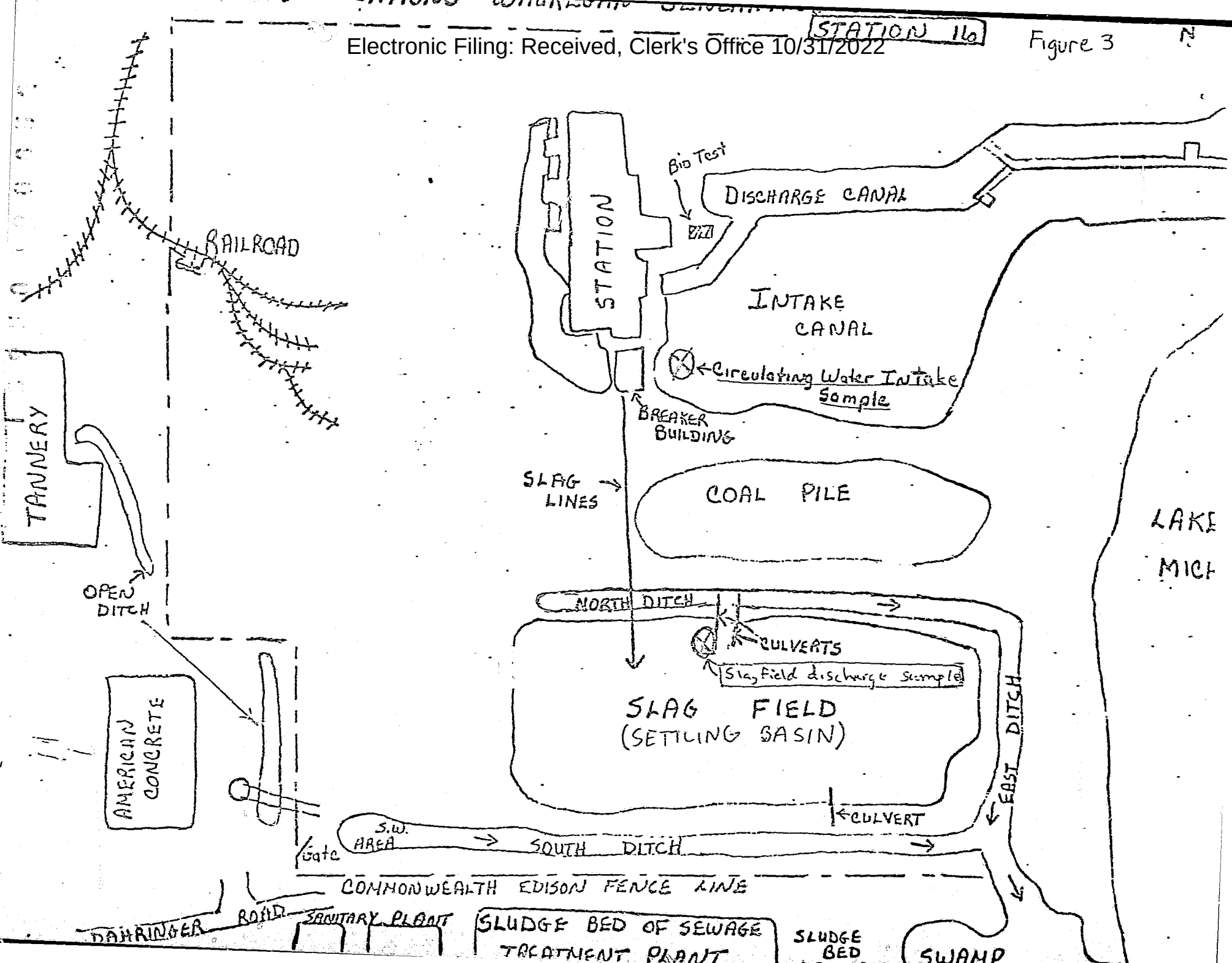
STATION 116

Figure 3



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Commonwealth Edison
72 West Adams Street, Chicago, Illinois
Address Reply to: Post Office Box 767
Chicago, Illinois 60690

4553-73
attach to Commonwealth Edison Waukegan
1974-EB-346-OP
3/14/74

Sent to J.M. 12/27/73 3:10PM

December 19, 1973

[illegible]

DEC 27 1973

[illegible] AGENCY
[illegible] CONTROL
[illegible] FIELD
[illegible]

Mr. William H. Busch, Manager
Permit Section
Division of Water Pollution Control
Illinois Environmental Protection Agency
2200 Churchill Road
Springfield, Illinois 62706

Dear Mr. Busch:

Re: Log #502-73 Permit Application for Wastewater Sources at Waukegan Generating Station, Commonwealth Edison Company, Previously Log #3603-72

In response to your letter of February 15, 1973 requesting additional information we are submitting the following information:

1A. Enclosed are the plans of the modification made to the demineralizer regenerative wastewater and the filter backwash discharges (Figure 1). This is the only sketch available, and it is the original plan that the contractor used in construction.

1B. Also submitted are the plans for the point of discharge from the slag field (settling basin) (Figures 2&3). Previously, the discharge had been on our property, but due to the changing nature of the swampy area, the ditch now discharges outside the property line. Samples are taken at a point before the slag field discharges to the ditch. This location is marked on attached plans.

1C. The dissolved iron concentrations were measured in the slag field discharge and are provided on the enclosed table. The concentrations are in compliance with Rule 408, in which the standard is 0.5 mg/l of dissolved iron.

We request that you reactivate our pending permit application with respect to Discharge #2 (slag field and settling basin discharge), and issue the permit as promptly as possible.

Sincerely,

J. P. McCluskey

J. P. McCluskey
Director of
Environmental Affairs

JPM:CK:gm

attachments

Electronic Filing: Received, Clerk's Office 10/31/2022

XXXXXXXXXXXXXXXXXX
Governor

STATE OF ILLINOIS

XXXXXXXXXXXXXXXXXX
DIRECTOR

ENVIRONMENTAL PROTECTION AGENCY

February 15, 1973

PLEASE REPLY TO:
PERMIT SECTION, EPA
2121 West Taylor Street
Chicago, Illinois 60612
Phone: (312) 793-3730

COMMONWEALTH EDISON COMPANY - Waukegan Generating Station
(Lake County) Discharge Modifications
LOG #502-73

Commonwealth Edison Company
P. O. Box 767
Chicago, Illinois 60690

Attn.: Mr. K. C. Chun

Gentlemen:

This will acknowledge the receipt on February 2, 1973, of your January 30, 1973, letter regarding the Waukegan Generating Station. We offer the following comments for your consideration and appropriate action:

1. As per your request, we will consider Part I (submitted for information only with your December 22, 1972, application) as an application for Permit for the modifications made to the demineralizer regenerative wastewater and the filter backwash discharges. However, the following additional information is necessary for our review of this project:

   A. Submit As-Built plans of the modifications.

   B. Submit plans of the point of discharge from the settling basin.

   C. The dissolved iron measurements described in Item #5 of your letter must be provided.

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February 15, 1973

COMMONWEALTH EDISON COMPANY
Waukegan Generating Station

2. No further action can be taken on the proposed modifications to the cooling water discharge canal pending receipt of the Environmental Impact Statement required by the U. S. Army Corp of Engineers, and the receipt of an Application for a Construction Permit.

3. A separate letter, entitled "Application for Waste Transportation Permit", should be sent to the attention of the Director of this Agency, with a copy to the Permit Section, DWPC, 2121 West Taylor Street, Chicago, Illinois 60612. This letter should contain, in addition to the name of the scavenger an the disposal site, information regarding the sources, amount, and composition of the sludge.

4. No further action will be taken on the Operating Permit Application for the Waukegan Station (denied January 15, 1973) pending receipt of the information of the information listed in Items #4 and #5 of your letter.

If you have any further comments or questions regarding this project, please contact this Agency at 2121 West Taylor Street, Chicago, Illinois 60612.

Very truly yours,

DIVISION OF WATER POLLUTION CONTROL

William C. Walker

William C. Walker
ENVIRONMENTAL PROTECTION ENGINEER
Permit Section
Des Plaines Basin Unit

WCW:ah

CC -EPA, Springfield, William H. Busch, Permit Section

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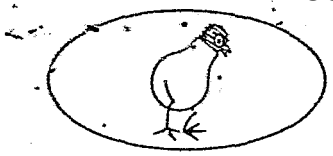

Commonwealth Edison Company

72 WEST ADAMS STREET ★ CHICAGO, ILLINOIS

Address Reply to:
POST OFFICE BOX 767 ★ CHICAGO, ILLINOIS 60690

January 30, 1973

RECEIVED
50 2-13

Mr. William H. Busch, Manager
Permit Section
Division of Water Pollution Control
Illinois Environmental Protection Agency
2200 Churchill Road
Springfield, Illinois 62706

Dear Mr. Busch:

Re: Log #3603-72, Permit Application for Wastewater Sources at Waukegan Generating Station, Commonwealth Edison Company

In response to your January 15, 1973 letter of permit denial on our operating permit application for Waukegan generating station, and in accordance with the telephone conversation on January 26, 1973 between Mr. William C. Walker of your agency's Chicago office and K. C. Chun of the Commonwealth Edison Company, we are submitting the following information for each of five items noted in the reference letter:

1) We request that Part I of our original permit application, signed, attested and submitted for information only on December 22, 1972 to be considered as our formal modification application for rerouting the demineralizer regenerative wastewater and the filter backwash streams.

2) A permit application to modify the existing cooling water discharge bay was submitted to U.S. Army Corps of Engineers on December 4, 1972. The proposed modification is intended to reduce the impact of the heated discharge water on the temperature regime of the receiving water. The permit application, however, is being held in abeyance until additional information on the impact the proposed work will have on the environment is furnished to the Corps of Engineers. As soon as we are ready to submit such information to the Corps of Engineers, we will submit a construction permit application to your agency.

3) The name of the contractor for the disposal of debris collected by the traveling screens is:

Waukegan Disposal Service
2330 Ernest Greger Circle
Waukegan, Illinois 60085

The collected debris is disposed at either of the following two landfill sites:

North Chicago Landfill (IEPA Permit #1971-20)
14 Street and Green Bay Road
North Chicago, Illinois

Waukegan Landfill (IEPA Permit #72-11)
Sunset Avenue
Waukegan, Illinois

4) It is uncertain at present whether the heated effluent from Waukegan generating station complies with Rule 206, (e), (1), (A) at all times with the maximum mixing zone allowable (a circle with a radius of 1,000 ft. or an equal fixed area of simple form). Due to this uncertainty, the plan to modify the existing cooling water discharge bay was proposed as described in our original permit application.

A petition for variance to operate until the new structure is completed will be filed with the Illinois Pollution Control Board in the next few weeks. The decision of the Board on the petition for variance will be promptly notified to your section so that our operating permit application could possibly be reactivated.

5) The level of suspended solids concentration in Discharge #2 (settling basin or slag field discharge) during the past six months is well within the limit of Rule 408. However, it is uncertain whether we are in compliance with regard to dissolved iron concentration because it has not been analyzed in the past. We will conduct an intensive monitoring of the dissolved iron concentration in this discharge #2 during the next few weeks. We will report the results of the monitoring to your agency, and will submit a project completion schedule if we find that we are not in compliance with regard to dissolved iron concentration.

We hope the above information has satisfied all of your concerns on the reference permit application.

Very truly yours,

Joseph P. McCluskey
Director of Environmental Affairs

JPM:KCC:bd

cc: Mr. Gary D. Harmon

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Commonwealth Edison Company
72 WEST ADAMS STREET ★ CHICAGO, ILLINOIS
Address Reply to:
POST OFFICE BOX 767 ★ CHICAGO, ILLINOIS 60690

December 22, 1972

RECEIVED
DEC 28 1972
ENVIRONMENTAL PROTECTION AGENCY
STATE OF ILLINOIS

Mr. William H. Busch, Manager
Permit Section
Division of Water Pollution Control
Illinois Environmental Protection Agency
2200 Churchill Road
Springfield, Illinois 62706

Dear Mr. Busch:

Re: Permit Application for Wastewater Sources at Waukegan Generating Station, Commonwealth Edison Company.

Enclosed for your review and approval is an operating permit application for the existing wastewater sources and treatment facilities at our Waukegan generating station. This is submitted in accordance with Rule 903 and 911, Chapter 3, Water Pollution, of the Illinois Pollution Control Board Rules and Regulations, and in accordance with "Instructions for Completing Application for Permit" provided by your office.

Sections I, II, III and VII of Part I, and sections I, II, III and V of Part II of the permit application form have been completed. Sections IV to VI of Part I and section IV of Part II are not applicable to our operation at Waukegan generating station. Part I is submitted for information only. Additional information required by Rule 911 is supplied in the supplement attached to the application form. The supplement contains:

1. Description of intake and discharge
2. Description of individual component streams of the station discharge
3. Specifications, details, and flow diagrams of waste treatment facilities prepared by registered professional engineers.

If you require any further information with regard to this permit application, please let us know.

Yours truly,

J. P. McCluskey
Director of Environmental Affairs

JPM:lm
Encl.
cc: Mr. Gary Harmon

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Exhibit

33

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PERMIT/PLAN/SPECIFICATION
MICROFILM "JACKET" INFORMATION

1. Division Code: W
2. FIPS County Code: 097
3. City/Township Code: 190
4. Governing Body Code: 0620A
5. PERMITTEE NAME (File Subject)

COM_ED-WAUK_NON_THERMAL_OLS

6. File Division: 03
7. IEPA Permit Number: 1977EB3699-

CROSS-REFERENCE INFORMATION

8. Governing Body Name

COMMONWEALTH_EDISON_COMPANY

9. ~~F/S/P Code~~: B0133
10. NPDES Number: IL00

DWPC Records Unit

IL 532-0486
ADM 1081 8/78

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ILLINOIS ENVIRONMENTAL PROTECTION AGENCY
WATER POLLUTION CONTROL PERMIT

PERMIT NO.: 1977-EB-3699 DATE ISSUED: July 1, 1977

FINAL PLANS, SPECIFICATIONS, APPLICATION AND SUPPORTING DOCUMENTS PREPARED BY: S. J. Dea LOG NUMBERS: 3699-77

SUBJECT: COMMONWEALTH EDISON COMPANY - Waukegan Station Non-Thermal Discharges

PERMITTEE TO CONSTRUCT, OWN AND OPERATE
Commonwealth Edison Company
Post Office Box 767
Chicago, Illinois 60690

Attn: Mr. John Hughes

Permit is hereby granted to the above designated permittee(s) to construct and/or operate water pollution control facilities described as follows:

Modifications and additions to the existing non-thermal discharge systems to provide physical/chemical treatment to 5.67 MGD DMF from the Ash Transport System blowdown and gas side cleaning discharges; to .083 MGD DMF from the demineralizer regenerant waste discharge; and, to 4.48 MGD DMF from coal pile, roof and yard runoff, and floor drain discharges with effluent going to the cooling water discharge flume thence to Lake Michigan.

This Permit is issued subject to the following Special Condition(s). If such Special Condition(s) require(s) additional or revised facilities, satisfactory engineering plan documents must be submitted to this Agency for review and approval for issuance of a Supplemental Permit.

SPECIAL CONDITION #1: Sludges generated in the wastewater treatment processes must be disposed of in a manner approved of by this Agency's Division of Land Pollution Control.

THE STANDARD CONDITIONS OF ISSUANCE INDICATED ON THE REVERSE SIDE OF THIS PERMIT (PAGE 1a) MUST BE COMPLIED WITH IN FULL. READ ALL CONDITIONS CAREFULLY.

WHB:DWR:bl/TH13,15
cc: EPA - Region II
NUS Corporation
DAPC Permit Section
Barbara Sidler, DWPC Enforcement

DIVISION OF WATER POLLUTION CONTROL

W. H. Busch
by C. W. Fellman

William H. Busch
Manager, Permit Section

Com - Ed - Waukegan Generating Station - Non Thermal STP

Proposed system intends to meet Chapter 3 Standards by using redundant equipment, alternate flow paths and conservative sizing of the treatment equipment

Piping - Velocities in all solid bearing pipes ≥ 5 fps
buried ≥ 50 inches

Stormwater runoff coefficients - treatment values are based on a 10-year 24-hour storm pipe sizing is based on a 1-hour 100 year

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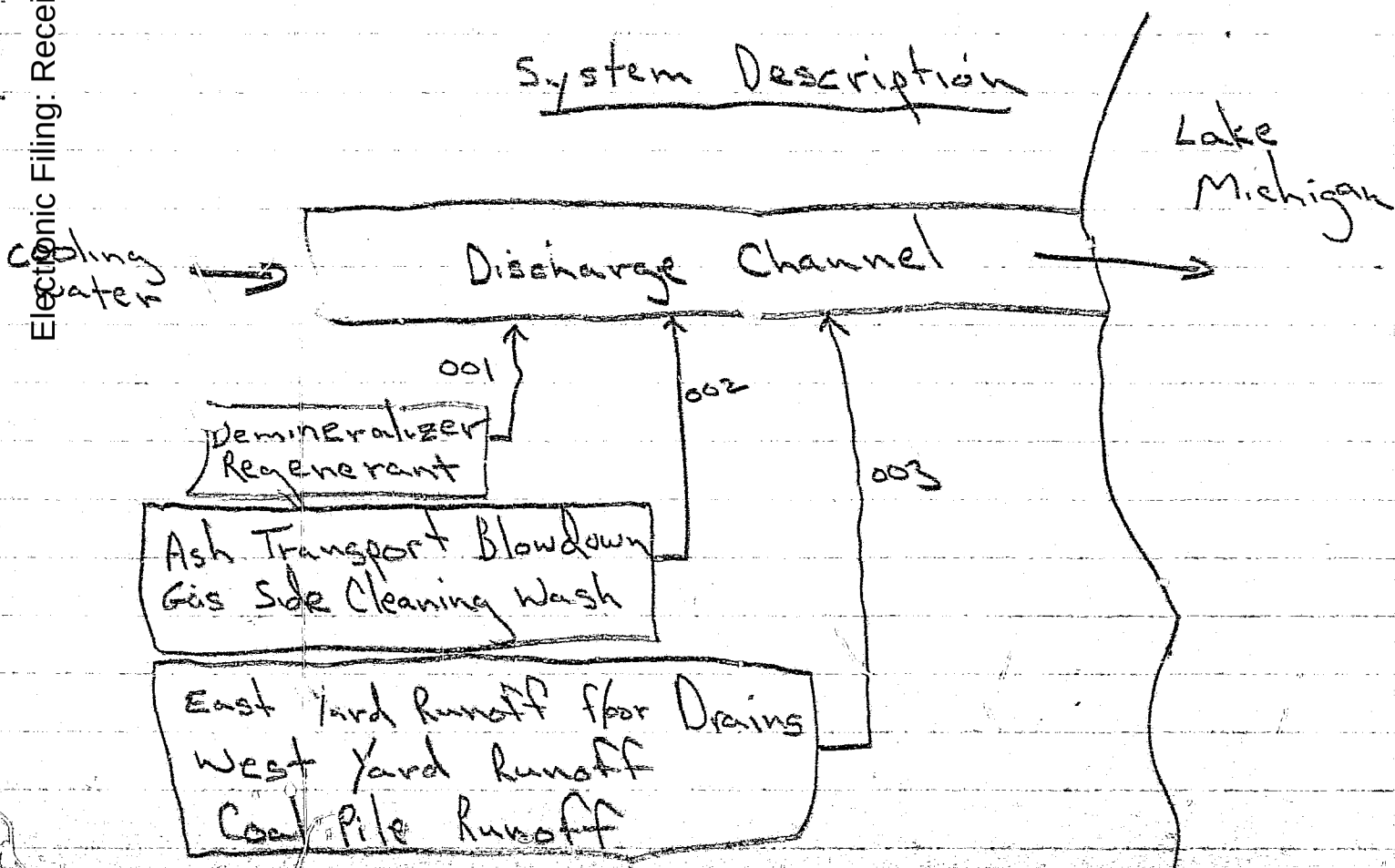
System Description



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Demineralizer Regenerant

The regeneration is collected in a 150,000 gal tank for mixing and equalization (tank is lined with carbon steel). The waste will be equalized within one hour. The DAF is ½ the size of the equalization tanks or 56000 GPD

Parameters of this waste before entering main discharge canal

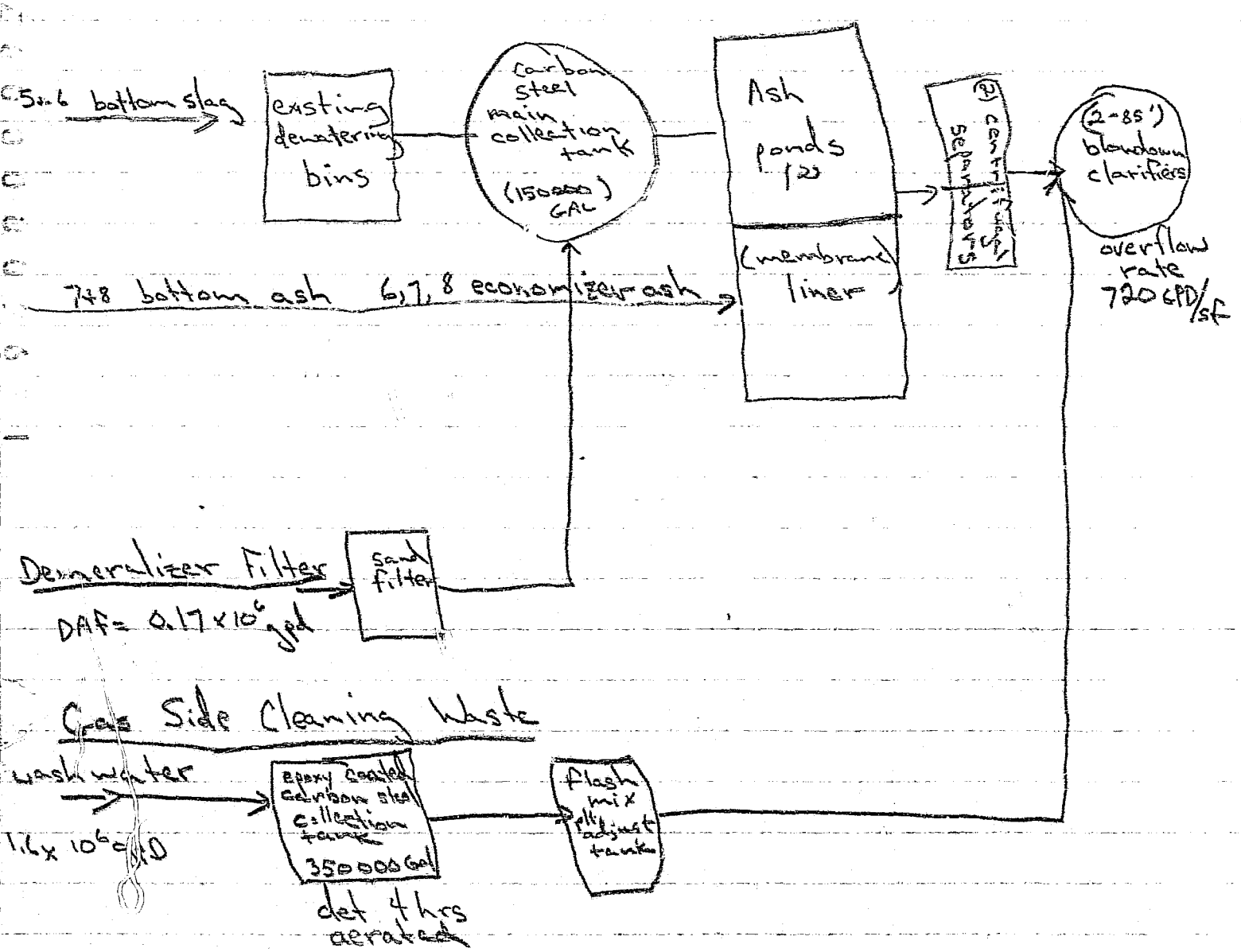
Copper	1.0 mg/l	
Iron	1.0 mg/l	5.0 mg/l
lead	0.1 mg/l	
manganese	1.0 mg/l	5.0 mg/l
mercury	0.0005 mg/l	0.0025 mg/l
nickel	1.0 mg/l	5.0 mg/l
pH	1.0 mg/l	9.0 mg/l
phosphorous	1.0 mg/l	1.0 mg/l
sulfate	5900 mg/l	7000 mg/l
Suspended Solids	15 mg/l	75 mg/l
Total Dissolved Solids	7800 mg/l	10000 mg/l
Zinc	1.0 mg/l	5.0 mg/l

These values are from schedule N-3

Waste Water Treatment System

Ash Transport System

Economizer ash, bottom ash, and bottom slag must be sluiced to the treament facility for solids separation



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5 economizer ash is collected dry

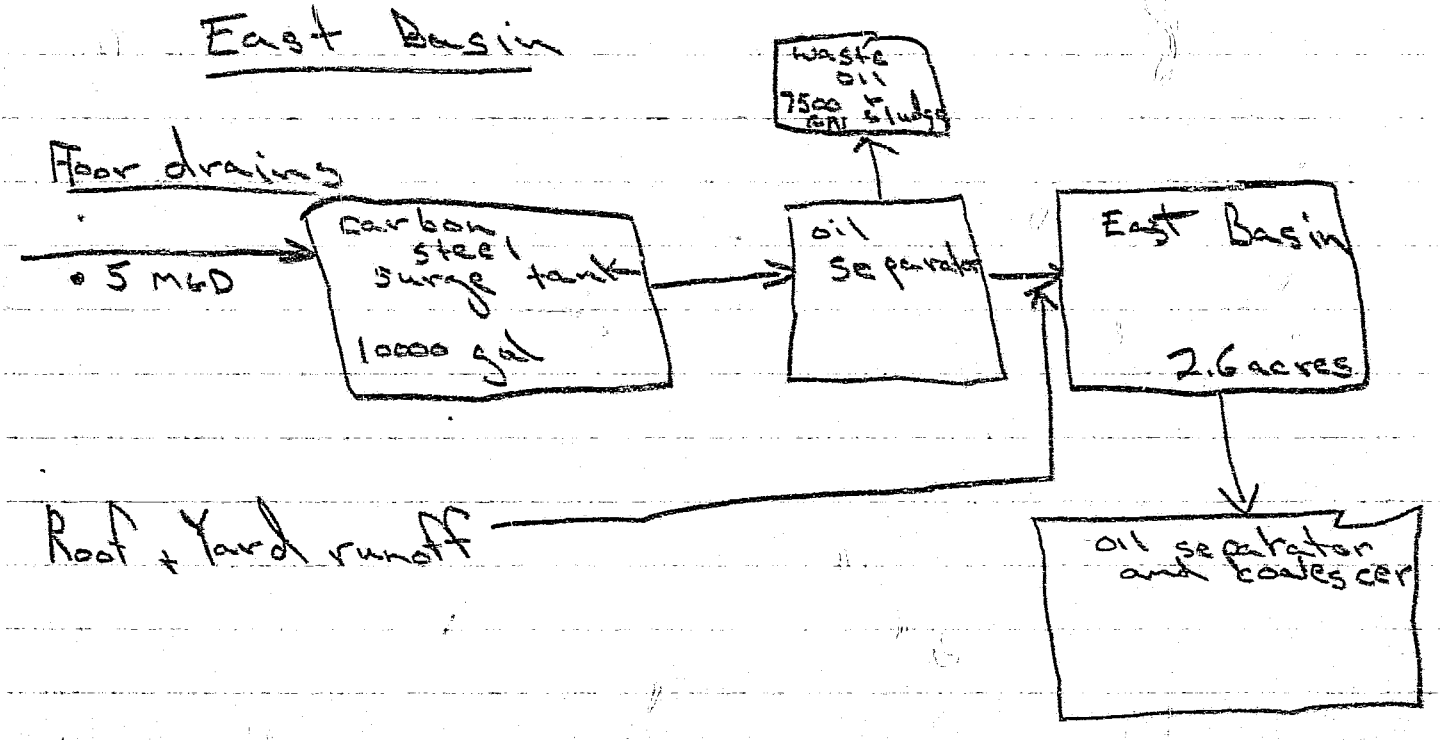
each pond is ≈ 10 acres
DAF from ponds = 10.91×10^6 GPD

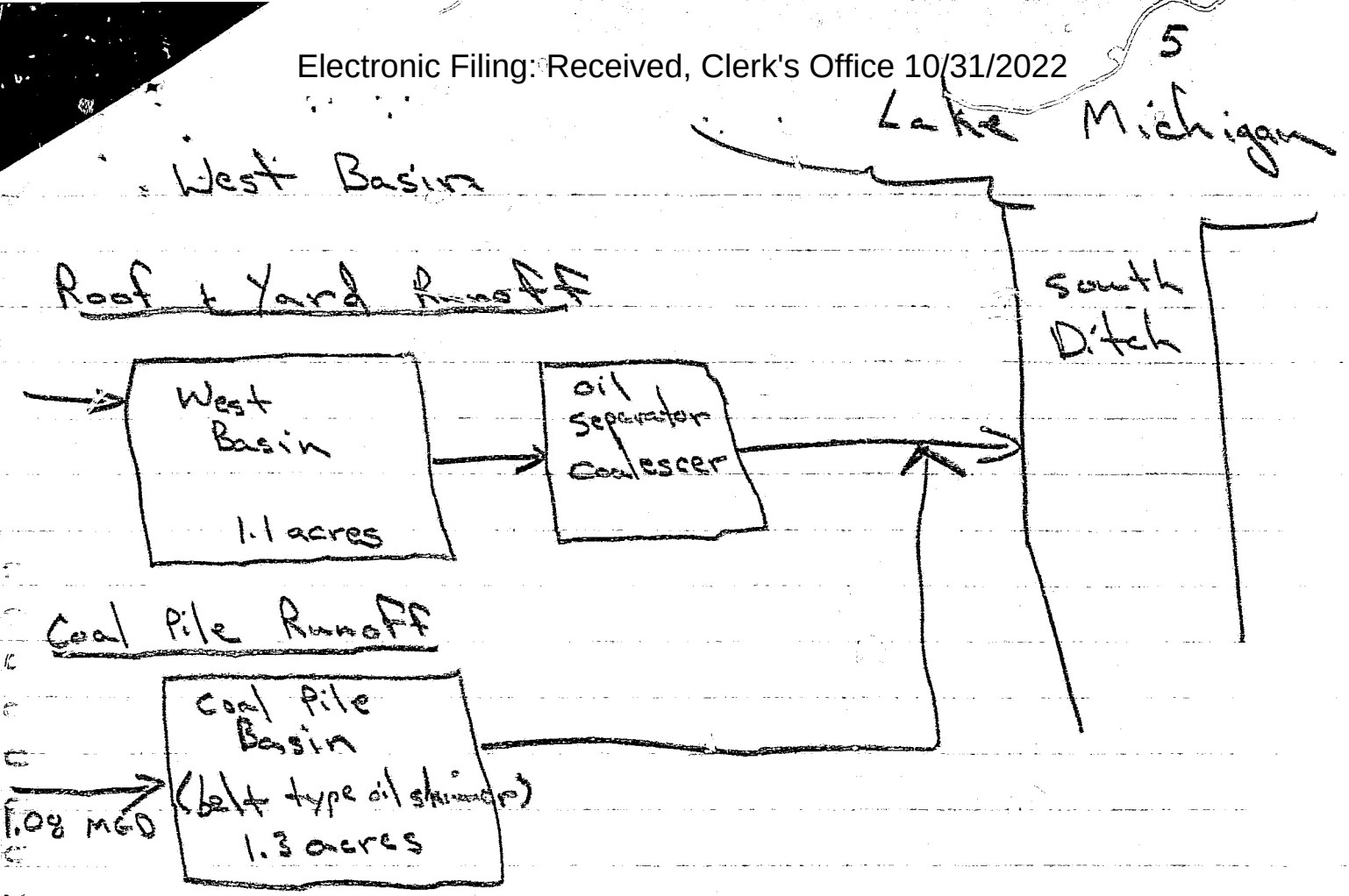
anionic polymer added to blowdown clarifier to enhance settling
the sludge from the blowdown clarifier will be pumped to a drum type vacuum filter or filter press

Boiler Blowdown

no discharge → complete recycle

East Basin





all basins shall be equipped with a polymer feed system to increase settling

TDS = 358 mg/l P = .03 mg/l

Oil + Suspended Solids = 15 mg/l

Iron = 1.0 mg/l

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Problems

Water Quality Standards of Lake Michigan
Phosphorus and Total Dissolved Solids
possibly exceed water quality

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LOG: 3699-77
DATE RECEIVED:

ILLINOIS ENVIRONMENTAL PROTECTION AGENCY
DIVISION OF WATER POLLUTION CONTROL
PERMIT SECTION
Springfield, Illinois 62706

RECEIVED
MAR 30 1977
ENVIRONMENTAL PROTECTION AGENCY
DIV. OF WATER POLLUTION CONTROL
RECORDS UNIT — SPRINGFIELD
STATE OF ILLINOIS

APPLICATION FOR PERMIT OR CONSTRUCTION APPROVAL

WPC-PS-1

1. NAME AND LOCATION:

Name of project: Waukegan Generating Station

Municipality or Township Waukegan County Lake

2. BRIEF DESCRIPTION OF PROJECT: Wastewater treatment facilities for process and non-process wastewaters.

3. DOCUMENTS BEING SUBMITTED: If the project involves any of the items listed below, submit the corresponding schedule, and check the appropriate spaces.

PROJECT					
Private Sewer Connection	A___	Industrial Treatment or Pretreatment	J X		
Public Sewer Extension	B___	Deepwell Injection	K___		
Sewer Extension Construct Only	C___	Cyanide Acceptance	L___		
Sewage Treatment Works	D___	Updating Cyanide Acceptance Form	M___		
Excess Flow Treatment	E___	Waste Characteristics	N X		
Lift Station/Force Main	F___	NPDES - Municipal	O___		
Sludge Disposal	G X	NPDES - Agricultural	P___		
Spray Irrigation	H___	NPDES - Industrial	Q___		
Septic Tanks	I___	Others	___		

Plans: Title (See engineer's system description supplement and accompanying drawings) Number of Pages

Specifications: Title (See engineer's system description supplement and accompanying drawings) Number of Books/Pages

Other Documents (Please Specify)

4. This is an Application for: Construction Permit____, Operating Permit____, Joint Construction and Operating X, Construction Approval____, NPDES Permit____, Cyanide Acceptance Permit____, or Other Permit____.

5. CERTIFICATIONS AND APPROVAL

5.1 Certificate by Design Engineer

I hereby certify that I am familiar with the information contained in this application and that to the best of my knowledge and belief such information is true, complete and accurate.

ENGINEER S. J. Dea
NAME

S. J. DEA 6234890
REGISTRATION NUMBER

FIRM NUS Corp.

ADDRESS Rockville, Maryland

SIGNATURE S. J. Dea

6234890 REGISTERED PROFESSIONAL ENGINEER OF ILLINOIS

PHONE NUMBER 301-948-7010

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Certificate by Applicant(s)

I/We hereby certify that I/we have read and thoroughly understand the conditions and requirements of this Application. I/We hereby agree to conform with the Standard Conditions and with any other Special Conditions made part of the Permit.

5.2.1 NAME OF APPLICANT FOR PERMIT TO CONSTRUCT Commonwealth Edison Company

72 W. Adams St. P.O. Box 767, Chicago IL 60690
STREET CITY STATE ZIP CODE

SIGNATURE Dyson Lee Jr DATE 3-22-77

TITLE Vice President

5.2.2 NAME OF APPLICANT FOR PERMIT TO OWN AND OPERATE Commonwealth Edison Company

72 W. Adams St. P.O. Box 767, Chicago IL 60690
STREET CITY STATE ZIP CODE

SIGNATURE Dyson Lee Jr DATE 3-22-77

TITLE Vice President

5.3 Attested (Units of Government)

DATE SIGNATURE TITLE
(CITY CLERK, VILLAGE CLERK, SANITARY DISTRICT CLERK, PT CLERK)

5.4 Applications from non-governmental applicants which are not signed by the owner, must be accompanied by evidence of authority to sign the application.

5.5 Certificate by INTERMEDIATE SEWER OWNER

I hereby certify that the sewers to which this project will be tributary have adequate reserve capacity to transport the wastewater that will be added by this project without causing a violation of the Environmental Protection Act or Chapter 3 of the Regulations as adopted by the Illinois Pollution Control Board.

Name of sewer system to which this project will be tributary:

NAME OF SEWER SYSTEM OWNER

STREET CITY STATE ZIP CODE

SIGNATURE DATE TITLE

5.6 Certificate by Waste Treatment Works Owner

I hereby certify that the treatment works to which this project will be tributary have adequate reserve capacity to treat the wastewater that will be added by this project without causing a violation of the Environmental Protection Act or Chapter 3 of the Regulations as adopted by the Illinois Pollution Control Board.

TREATMENT WORKS OWNER

STREET CITY STATE ZIP CODE

SIGNATURE DATE TITLE

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FOR IEPA USE: 1/4/74
LOG #369-77
DATE RECEIVED:

RECEIVED
MAR 30 1977
ENVIRONMENTAL PROTECTION AGENCY
DIV. OF WATER POLLUTION CONTROL
RECORDS UNIT — SPRINGFIELD
STATE OF ILLINOIS

ILLINOIS ENVIRONMENTAL PROTECTION AGENCY
DIVISION OF WATER POLLUTION CONTROL
PERMIT SECTION
Springfield, Illinois 62706

SCHEDULE G SLUDGE DISPOSAL

1. PART I GENERAL

1.1 NAME AND LOCATION: Name of project Waukegan Generating Station

1.2 SLUDGE CHARACTERISTICS

1.2.1 Sources Wastewater Treatment Plant, Physical-Chemical Treatment

1.2.2 Volumes (1) 15,000 GPD; (2) 205,000 GPD; (3) 140,000 GPD; (4) 21,000 GPD

1.2.3 Submit Schedule N (1) - 5%; (2) - 3%; (3) - 25%; (4) - 90%

1.2.4 Sludge Solids by Weight = _____ %

1.2.5 Sludge is: Aerobically Digested _____, Anaerobically Digested _____, Heat Anaerobically Digested _____, Raw _____, Mixture X. If mixture, describe: (See Sludge Description Below).

2. PART II FOR SLUDGE TRANSPORT APPROVAL:

2.1 NAME(S) ADDRESS(ES) AND LICENSE NUMBER(S) OF THE SLUDGE HAULER(S)

Sludge hauler will be determined during operational phase. Supplemental permit will be requested at that time.

3. PART III FOR SLUDGE DISPOSAL SITE APPROVAL:

3.1 STATE METHODS OF SLUDGE DISPOSAL

Land Application _____

Sanitary Landfill _____

Commercial Fertilizer Production _____

Incineration (See Instruction) _____

Other _____ Describe Settled ash from ash ponds will involve infrequent offsite disposal by licensed hauler.

3.2 NAME(S) ADDRESS(ES) AND LICENSE NUMBER(S) OF THE SLUDGE HAULER(S) _____

3.3 IEPA PERMIT NUMBER(S): _____

3.4 BASIS OF DESIGN AND OPERATION: Submit a narrative description of this disposal operation.

3.5 SAFETY PRECAUTIONS: Describe supplementary operating practices and design features to prevent ground and/or surface water pollution.

4. SLUDGE DISPOSAL (TREATMENT WORKS) OPERATORS: List names and certification numbers of operators:

(See 2.1)

1) Underflow from the bottom ash blowdown clarifiers which is sent to the ash pond for further thickening (25%)
2) Underflow from the metal cleaning clarifier which is sent to a filter for thickening to 35% solids.
3) Deposited bottom ash and slag in ash ponds.
4) Slag quantity from dewatering bins.

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IEPA DOW LOG # 3699-77
DATE RECEIVED:

RECEIVED
MAR 30 1977
ENVIRONMENTAL PROTECTION AGENCY
DIV. OF WATER POLLUTION CONTROL
RECORDS UNIT—SPRINGFIELD
STATE OF ILLINOIS

ILLINOIS ENVIRONMENTAL PROTECTION AGENCY
DIVISION OF WATER POLLUTION CONTROL
PERMIT SECTION
Springfield, Illinois 62706

SCHEDULE J INDUSTRIAL TREATMENT WORKS CONSTRUCTION OR PRETREATMENT

1. NAME AND LOCATION:

1.1 Name of project Waukegan Station

1.2 Plant Location

1.2.1 NE (Quarter Section) 15 (Section) 45N (Township) 12E (Range) 3 (P.M.)

1.2.2 Latitude 42° 23' 00" North
Longitude 87° 48' 30" West

1.2.3 Name of USGS Quadrangle Map (7.5 or 15 minutes) Zion (7.5 min.)

2. NARRATIVE DESCRIPTION AND SCHEMATIC WASTE FLOW DIAGRAM: (see instructions)

Wastewaters will be chemically coagulated and settled. Underflow from the metal cleaning clarifier will be dewatered by sludge filters. Ash transport system sluice water will be recycled after gravity settling at ash ponds. Ash transport system blowdown will be treated in wastewater treatment system.

2.1 PRINCIPAL PRODUCTS: Production of electricity.

2.2 PRINCIPAL RAW MATERIALS: Coal

3. DESCRIPTION OF TREATMENT FACILITIES:

3.1 Submit a flow diagram through all treatment units showing size, volumes, detention times, organic loadings, surface settling rate, weir overflow rate, and other pertinent design data. Include hydraulic profiles and description of monitoring systems.

3.2 Waste Treatment Works is. Batch ____, Continuous X; No. of Batches/day ____, No. of Shifts/day ____

3.3 Submit plans and specifications for proposed construction. See engineer's system description and accompanying drawings.

3.4 Discharge is: Existing X; Will begin on ____.

4. DIRECT DISCHARGE IS TO: Receiving Stream X Municipal Sanitary Sewer ____, Municipal storm or municipal combined sewer ____. If receiving stream or storm sewer indicated complete the following:

Name of receiving ~~stream~~ Lake Lake Michigan; tributary to ____, tributary to ____; tributary to ____.

5. Is the treatment works subject to flooding? If so, what is the maximum flood elevation of record (in reference to the treatment works datum) and what provisions have been made to eliminate the flooding hazard? No

6. APPROXIMATE TIME SCHEDULE: Estimated construction schedule:

Start of Construction 9/77; Date of Completion 10/78.

Operation Schedule N.A.; Date Operation Begins 12/78,

100% design load to be reached by year N.A.

N.A. - Not available.

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DESIGN LOADINGS:

7.1 Design population equivalent based on [illegible] gallons of wastewater per day, containing 0.17 pounds of BOD_5 and 0.20 pounds of suspended solids: day, PE

BOD 0 ; Suspended Solids 10,000/Clarifier/ ; Flow 21,600 PE/ Clarifier

7.2 Design Average Flow Rate 2.16 MGD/Clarifier MGD.

7.3 Design Maximum Flow Rate 3.74 MGD/Clarifier MGD.

7.4 Design Minimum Flow Rate - MGD.

7.5 Minimum 7-day, 10-year low flow N.A. cfs MGD.

Minimum 7-day, 10-year flow obtained from .

7.6 Dilution Ratio N.A. : .

8. FLOW TO TREATMENT WORKS (if existing):

8.1 Flow (last 12 months)

8.1.1 Average Flow 6.2 MGD (Units 5 & 6)

8.1.2 Maximum Flow N.A. MGD

8.2 Equipment used in determing above flows Estimated based on plant flows & hydaulic calculations

9. Has a preliminary engineering report for this project been submitted to this Agency for approval?

YES ____ NO X . If so, when was it submitted and approved. Date Submitted

Certification#

Dated

10. List Permits previously issued for the facility: None

11. Describe provisions for operation during contingencies such as power failures, flooding, peak loads, equipment failure, maintenances shut-downs and other emergencies.* Facilities are not subject to flooding. Equalization and pumping facilities are provided to handle the peak loads. The treatment facilities are designed for the maximum daily flow. All critical units are provided in duplicate and provision has been made to divert the total flow through one unit if the other unit is shut down for maintenance.

12. Complete and submit Schedule G if sludge disposal will be require by this facility.

13. BASIL CHARACTERISTICS: Schedule N must be submitted.

14. TREATMENT WORKS OPERATOR CERTIFICATION: List names and certification numbers of certified operators:

None at this time.

* Emergency provisions during power failures - 2-12KV busses feed the system and provide flexibility in case of equipment breakdown.

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SCHEDULE N WASTE CHARACTERISTICS

1. Name of project Waukegan Power Station, 003 Coal Pile, Roof & Yard Runoff & Floor Drains Discharge

2. FLOW DATA

	EXISTING	PROPOSED-DESIGN
2.1 Average Flow (gpd)		2.08×10^6 (1)
2.2 Maximum Daily Flow (gpd)		4.48×10^6 (2)

2.3 TEMPERATURE

Time of Year	Avg. Intake Temp. F	Avg. Effluent Temp. F	Max. Intake Temp. F	Max. Effluent Temp. F	Max. Temp. Outside Mixing Zone F
SUMMER				Ambient	
WINTER				Ambient	

2.4 Minimum 7-day, 10-year flow: N.A. cfs _____ MGD.

Indicate source of minimum 7-day, 10-year flow _____.

2.5 Dilution Ratio: N.A. : _____.

2.6 Stream flow rate at time of sampling _____ cfs _____ MGD.

3. CHEMICAL CONSTITUENT Existing Permitted Conditions ____; Existing conditions ____; Proposed Permitted Conditions X. Type of sample: ___ grab (time of collection ____); X composite (number of samples per day ____) (see instructions for analyses required)

		RAW WASTE (mg/l)	TREATED EFFLUENT Avg. (mg/l)	TREATED EFFLUENT Max.	UPSTREAM (mg/l)	DOWNSTREAM SAMPLES (mg/l)
Ammonia Nitrogen (asN)	NTF					
Arsenic (total)	NTF					
Barium	NTF					
Boron	NTF					
BOD_5	NTF					
Cadmium	NTF					
Carbon Chloroform Extract	NTF					
Chloride	NTF					
Chromium (total hexavalent)	NTF					
Chromium (total trivalent)	NTF					
Copper	NTF					
Cyanide (total)	NTF					
Cyanide (readily released @150°F & pH 4.5)	NTF					
Dissolved Oxygen	NTF					
Fecal Coliform	NTF					

(1) Floor drains only.
(2) Floor drains & 10 year 24 hr. storm.

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		RAW WASTE (mg/l)	TREATED EFFLUENT Avg. (mg/l)	TREATED EFFLUENT Max.	UPSTREAM (mg/l)	DOWNSTREAM SAMPLES (mg/l)
Fluoride	NTF					
Hardness (as Ca CO_3)	NTF					
Iron (total)	NTF	7.0	1.0	1.0		
Lead	NTF					
Manganese	NTF					
MBAS	NTF					
Mercury	NTF					
Nickel	NTF					
Nitrates (asN)	NTF					
Nitrites (asN)	NTF					
Oil & Grease (hexane solubles or equivalents)		200	15	20		
Organic Nitrogen (as N)	NTF					
pH		6-9	6-9	6-9		
Phenols	NTF					
Phosphorous (as P)	NTF					
Radioactivity	NTF					
Selenium	NTF					
Silver	NTF					
Sulfate	NTF					
Suspended Solids		200	15	75		
Total Dissolved Solids		500	500	750		
Zinc	NTF					
Others						

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DIVISION OF WATER POLLUTION CONTROL
PERMIT SECTION
Springfield, Illinois 62706

SCHEDULE N WASTE CHARACTERISTICS

1. Name of project Waukegan Power Station 001 - Ash transport system blowdown & gas side cleaning discharge.

2. FLOW DATA

	EXISTING	PROPOSED-DESIGN
2.1 Average Flow (gpd)		4.07×10^6
2.2 Maximum Daily Flow (gpd)		5.67×10^6

2.3 TEMPERATURE

Time of year	Avg. Intake Temp. F	Avg. Effluent Temp. F	Max. Intake Temp. F	Max. Effluent Temp. F	Max. Temp. Outside Mixing Zone F
SUMMER				Ambient	
WINTER				Ambient	

2.4 Minimum 7-day, 10-year flow: N.A. cfs _____ MGD.

Indicate source of minimum 7-day, 10-year flow N.A.

2.5 Dilution Ratio: N.A. : _____

2.6 Stream flow rate at time of sampling N.A. cfs _____ MGD.

3. CHEMICAL CONSTITUENT Existing Permitted Conditions ___; Existing conditions ___ ; Proposed Permitted Conditions X . Type of sample: ___grab (time of collection ___) X composite (number of samples per day 30) (see instructions for analyses required)

		RAW WASTE (mg/l)	TREATED EFFLUENT Avg. (mg/l)	TREATED EFFLUENT Max.	UPSTREAM (mg/l)	DOWNSTREAM SAMPLES (mg/l)
Ammonia Nitrogen (asN)	NTF					
Arsenic (total)	NTF					
Barium		≤10	≤ 2.0	10.0		
Boron		5.0	5.0	5.0		
BOD_5	NTF					
Cadmium	NTF					
Carbon Chloroform Extract	NTF					
Chloride		100	100	100		
Chromium (total hexavalent)		≤ .03	≤.03	.15		
Chromium (total trivalent)		≤1.0	≤1.0	5.0		
Copper		≤1.0	≤1.0	1.0		
Cyanide (total)	NTF					
Cyanide (readily released @150°F & pH 3.5)	NTF					
Dissolved Oxygen	NTF					
Fecal Coliform	NTF					

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	RAW WASTE (mg/l)	TREATED EFFLUENT Avg. (mg/l)	Max.	UPSTREAM (mg/l)	DOWNSTREAM SAMPLES (mg/l)
Fluoride NTF					
Hardness (as Ca CO_3) NTF					
Iron (total)	Variable	1.0	1.0		
Lead	Variable	.1	.5		
Manganese	$\leq$ 1.0	$\leq$1.0	5.0		
MBAS NTF					
Mercury	$\leq$ 0.0005	$\leq$0.0005	0.0025		
Nickel	Variable	1.0	1.0		
Nitrates (asN) NTF					
Nitrites (asN) NTF					
Oil & Grease (hexane solubles or equivalents)	$\leq$ 15	$\leq$15	20		
Organic Nitrogen (as N) NTF					
pH	6-9	6-9	6-9		
Phenols NTF					
Phosphorous (as P)	$\leq$ 1	$\leq$1.0	1.0		
Radioactivity NTF					
Selenium	$\leq$ .1	$\leq$ .1	.5		
Silver	$\leq$ .1	$\leq$ .1	.5		
Sulfate	150	150	250		
Suspended Solids	12,650	15	75		
Total Dissolved Solids	$\leq$3500	3500	11,000		
Zinc	$\leq$1.0	1.0	2.0		
Others					

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SCHEDULE N WASTE CHARACTERISTICS

1. Name of project Waukegan Power Station 002 Demineralizer Regenarent Waste Discharge

2. FLOW DATA

	EXISTING	PROPOSED-DESIGN
2.1 Average Flow (gpd)		$.056 \times 10^6$
2.2 Maximum Daily Flow (gpd)		$.083 \times 10^6$

2.3 TEMPERATURE

Time of year	Avg. Intake Temp. F	Avg. Effluent Temp. F	Max. Intake Temp. F	Max. Effluent Temp. F	Max. Temp. Outside Mixing Zone F
SUMMER				Ambient	
WINTER				Ambient	

2.4 Minimum 7-day, 10-year flow: N.A. cfs _____ MGD.

Indicate source of minimum 7-day, 10-year flow N.A.

2.5 Dilution Ratio: N.A. : _____.

2.6 Stream flow rate at time of sampling N.A. cfs _____ MGD.

3. CHEMICAL CONSTITUENT Existing Permitted Conditions ___; Existing conditions ___; Proposed Permitted Conditions X. Type of sample: ___grab (time of collection ___); ___composite (number of samples per day ___) (see instructions for analyses required) Calculated valves.

		RAW WASTE (mg/l)	TREATED EFFLUENT Avg. (mg/l)	TREATED EFFLUENT Max.	UPSTREAM (mg/l)	DOWNSTREAM SAMPLES (mg/l)
Ammonia Nitrogen (asN)	NTF					
Arsenic (total)	NTF					
Barium	NTF					
Boron	NTF					
BOD_5	NTF					
Cadmium	NTF					
Carbon Chloroform Extract	NTF					
Chloride	NTF					
Chromium (total hexavalent)	NTF					
Chromium (total trivalent)	NTF					
Copper		≤ 1.0	≤ 1.0	1.0		
Cyanide (total)	NTF					
Cyanide (readily released @150°F & pH 4.5)	NTF					
Dissolved Oxygen	NTF					
Fecal Coliform	NTF					

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	RAW WASTE (mg/l)	TREATED EFFLUENT Avg. (mg/l)	TREATED EFFLUENT Max.	UPSTREAM (mg/l)	DOWNSTREAM SAMPLES (mg/l)
Fluoride NTF					
Hardness (as $CaCO_3$) NTF					
Iron (Total)	1.0	1.0	5.0		
Lead	≤ 0.1	≤0.1	0.1		
Manganese	≤ 1.0	≤1.0	5.0		
MBAS NTF					
Mercury	≤0.0005	≤ 0.0005	≤ 0.0025		
Nickel	≤ 1.0	≤1.0	5.0		
Nitrates (asN) NTF					
Nitrites (asN) NTF					
Oil & Grease (hexane solubles or equivalents) NTF					
Organic Nitrogen (as N) NTF					
pH	1.0	1.0	9.0		
Phenols NTF					
Phosphorous (as P) TOTAL	≤ 1.0	≤1.0	1.0		
Radioactivity NTF					
Selenium NTF					
Silver NTF					
Sulfate	5900	5900	7000		
Suspended Solids	≤ 15	≤ 15	75		
Total Dissolved Solids	7800	7800	10000		
Zinc	≤1.0	≤1.0	5.0		
Others					

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ENGINEER'S SYSTEM DESCRIPTION SUPPLEMENT

CONSTRUCTION PERMIT APPLICATION
FOR PROPOSED WASTEWATER TREATMENT FACILITIES

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COMMONWEALTH EDISON COMPANY
Waukegan Power Station

BASIS OF DESIGN

The proposed wastewater treatment facility for the Waukegan Power Station is designed to meet Illinois Pollution Control Board Rules and Regulations' Chapter 3 for effluent discharges and U. S. Environmental Protection Agency's Steam Electric Power Generating Point Source Category for best practicable control technology currently available. The proposed system incorporates designs which minimize the dependency of the power station operation on the wastewater treatment system and ensures reliable, effective treatment. This is achieved with redundant equipment, alternate flow paths, and conservative sizing of the treatment equipment. The treatment system also incorporates standard wastewater engineering and design which allow for the operation and maintenance of proven treatment equipment. Velocities in all solids bearing pipes are designed to a minimum of 5 ft/sec, which will minimize any system failure due to pipe clogging. In addition, all piping will be freeze protected by burying the pipe below the frost line (50 inches), keeping a continuous protection flow in the pipe, making the pipe drainable, or heat tracing the pipe. All treatment systems which are continuous contain at least one spare pump, provided for redundancy. All stormwater runoff treatment volume values are based on the 10-year 24-hour storm (Technical Paper No. 40, "Rainfall Frequency Atlas of the United States", U. S. Department of Commerce and Weather Bureau, Washington, D. C., May, 1961). Runoff coefficients which were applied to the 10-year 24-hour storm were developed using criteria set forth in "Design of Roadside Drainage Channels", U. S.

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Department of Commerce, Bureau of Public Roads, Washington, D. C., 1965; "Airport Drainage", Department of Transportation, Federal Aviation Administration, Washington, D. C., July, 1970; "Drainage of Highway Pavements, Hydraulic Engineering Circular No. 12", U. S. Department of Transportation, Federal Highway Administration, Washington, D. C., March, 1969. All runcff piping and open channel conveyance systems are sized based on the 1-hour 100-year high intensity storm (Technical Paper No. 25, "Rainfall Intensity-Duration-Frequency Curves", U. S. Department of Commerce and Weather Bureau, December, 1955).

The overall treatment process for the Waukegan facility is presented in Flow and Mass Diagram SK2-9-77. Table 1 lists the sources, significant contaminants, and quantities of the wastewaters. Drawing 5082-C-5000 depicts the treatment facility equipment locations at the power station.

SYSTEM DESCRIPTIONS

Ash Transport System Blowdown

Economizer ash, bottom ash, and bottom slag, which are coal combustion products, will be transported to the proposed treatment facility for solids separation and reduction. The sluice water which is used in this transportation will be recycled back to the ash transport system. However, due to potential dissolved solids buildup with associated scaling problems and because of existing pumping configurations, a portion of this water will be blown down.

Units 5&6 bottom slag will be sluiced to existing dewatering bins where solids are removed. Overflow from these bins will be pumped to the ash pond via a carbon steel main collection tank (16BA105-T). This collection

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tank is sized to contain 150,000 gallons of wastewater for a 20-minute detention time at maximum flow. This will allow for an acceptable discharge pump cycling time and a manageable volume in which solids can be suspended by an air-blower system (16BA100-C & 16BA101-X). Units 7&8 bottom ash will be sluiced directly to the ash ponds for solids reduction. Units 6,7 & 8 economizer ash will be sluiced directly to the ash ponds for solids reduction. Unit 5 economizer ash is collected dry and, therefore, is not a wastewater source.

The existing ash pond will be modified to provide for easier and redundant operation. The existing single pond will be split into two separate ponds (16BA100-NA & NB), each approximately 10 acres. This design allows for the cleaning of one pond, when required, while the other pond remains in operation so that the settling is not disturbed. The ponds will also be protected with a membrane liner, e.g., hypalon, to prevent ground-water contamination. The discharge from these ponds, 10.91×10^6 gallons/day (gpd) will be pumped through two (2) full flow centrifugal separators (16BA100-FA & FB). These separators will further remove solids from this recycled waste stream and protect the ash sluice pumps in the ash transport system. The returned sluice water will be split into the recycled portion, 6.84×10^6 gpd, and the blowdown portion, 4.07×10^6 gpd. The pH of the recycle stream will be reduced to pH 6 with sulfuric acid in order to minimize scaling problems. The blowdown will be processed through two in-ground concrete, 85 ft diameter reactor clarifiers (16BA100-DA & DB, 16BA119-NA & NB), each sized for redundancy at 85% of full flow of 4.07×10^6 gpd. Each is designed with an overflow rate of 0.5 gallon/min/sq ft. An anionic polymer will be used to enhance the settling of the solids and will yield an average overflow of suspended solids concentration of 15 mg/l. The underflow from these clarifiers (3 -5% solids by weight) will

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be pumped to the ash ponds prior to offsite disposal. The overflow from the clarifiers will be neutralized with sulfuric acid, if necessary, to a pH range between 6 - 9 and discharged to the plant discharge canal.

Demineralizer Filter Backwash

Well water used to produce demineralized water is filtered in sand filters to remove suspended solids. These filters are backwashed periodically to remove the deposited solids. This waste, 0.17×10^6 gpd, will be pumped to the main collection tank (16BA105-T) and treated as described in the ash transport system blowdown of this report. The treatment equipment in the ash transport system is designed to handle the more severe condition for that system and, therefore, is conservatively designed for the demineralizer filter backwash.

Gas Side Cleaning Waste

Periodically, the gas contacted surfaces (air heater, boiler slope, and economizer) of the boilers are washed to remove ash or slag deposits. This resulting waste is a combination of ash or slag and corrosion products. Typically for western type coal (alkaline) fired stations such as the Waukegan Power Station, the composite pH of the wash water is between 8.5 to 9.5.

Within this pH range, dissolved metals are insoluble and precipitate out. Therefore, a precipitation system to remove these metals to meet the effluent limitations will not normally be required. However, because there exist various operator options as to washing the boiler and unexpected system upsets, a backup precipitation system will be installed.

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The gas side cleaning wash water (1.6×10^6 gpd) will be pumped to the 350,000 gallon epoxy coated carbon steel gas side waste water collection tank (16MC107-T). This tank will equalize the pH flow and constituents for four (4) hours. The solids will be kept in suspension by an air blower system (16MC101-C & 16MC100-X). The waste will be pumped to a concrete flash mix tank where caustic will be added, if required, to bring the pH within 8.5 - 9.5 range. The gas side cleaning waste will then overflow into one of the bottom ash blowdown clarifiers. Because each of the clarifiers is sized for 85% of the total blowdown flow and one of the units is not sluiced during washing, one clarifier can be isolated to treat the gas side cleaning waste while the other clarifier can treat the total ash transport system blowdown. The underflow (3 - 5% solids by weight) will be pumped to a sludge filter, e.g., drum type vacuum filter or filter press (16MC101-P), and the expected 35% solids cake hauled off site for disposal. The flux rate for the sludge filter will be designed at 10 lbs/sq ft/hr. The filtrate from the filter will be returned to the clarifier. The supernatent, which has been treated with an anionic polymer in the clarifier to yield a suspended solids level of 15 mg/l, will overflow and be neutralized to pH 6 - 9 with sulfuric acid along with the discharge ash transport system blowdown effluent.

Alternatively, the gas side cleaning waste can be treated with the ash transport blowdown waste without isolating the clarifiers. This allows the plant flexibility and redundancy. Since the clarifier system is sized to handle the more severe conditions of the ash transport blowdown, it is, therefore, conservatively sized to handle the gas side cleaning waste.

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Demineralizer Regenerant Wastes

The makeup demineralizers are regenerated when the resin beds are exhausted. The anion beds are regenerated using 5%, by weight, caustic solution and the cation beds using a stepwise 2%, 4% and 6% sulfuric acid solution. Each regeneration will be collected in a lined carbon steel equalization tank (16DW106-T). The tank will contain a mixing eductor (16DW105-L) that will equalize the tank's contents within one hour. The daily volume of regenerant waste, 56,000 gpd, will be batched in the tank on a daily basis, equalized and discharged to the plant discharge canal. The tank capacity, however, will be sized to accept two days of regeneration wastes. This will provide flexibility and redundancy to the system. The discharge effluent pH will be in the range of 1.3-9.

Boiler Blowdown & Drains

The boilers are periodically blown down to maintain a boiler water chemistry. The water volume is periodically drained to allow for tube repairs and cleaning of the inside of the tubes. This blowdown is in the steam phase and will be flashed in tanks (16HQ118-T, 119-T, 120-T & 121-T) to atmospheric pressure and pumped to an epoxy coated carbon steel high quality water collection tank (16HQ122-T). The tank will also receive water from the boiler drains. The size of the tank, 310,000 gallons, is designed to hold the most severe condition of two (2) of the largest boilers draining in series. The water from this tank will then be pumped back to the makeup filters via two (2) plate heat exchangers (16HQ100-AA & AB). These heat exchangers are sized to cool the recycle to 90°F in order to protect the demineralizer beds. There will be no liquid discharge from this system since it will all be recycled & reuse. There will be steam vents from the flash tanks.

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Floor Drains

Plant floor drain discharges are contaminated with suspended solids and oil. The flows from these can vary significantly over any period of time. It has been estimated that the average total daily flow is 0.5×10^6 gallons. This waste will be pumped from the existing plant bilge pumps to a carbon steel surge tank. This floor drain surge tank (16FD111-T) is sized at 10,000 gallons which provides sufficient surge capacity to equalize flow and constituent feed. From this tank the waste will be sent to a corrugated plate oil separator where oil and solids will be separated. The oil and sludge will be pumped to a 7,500-gallon carbon steel waste oil and sludge holding tank prior to offsite disposal. The treated effluent will be sent to the east roof and yard runoff basin for further treatment. This is required because some oil may become emulsified by the mechanical action of the bilge pumps. The roof and yard runoff system contains an oil coalescer to treat the emulsified oil fraction.

Roof & Yard Runoff System

Contaminated plant area and roof rainfall runoff that can enter navigable waterways will be collected and treated for suspended solids and oil and grease. The collection of these areas and roofs has been divided into two (2) basins, east (16CR109-N) and west (16CR110-N). These areas are shown on drawing 5082-SKC-4. Area notation 1E, 2E, and 3E will be collected in the east basin, and areas 1W, 2W, 3W, 4W, and 5W will be collected in the west basin. Each basin will receive the runoff flow through a gravity drain and berm system, with the exception of area 2E which will use a non-shearing pump. This collection scheme will minimize mechanical emulsification of oil and grease. Each basin system will contain anionic polymer feed system to enhance settling and solids removal

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within the basin. Each basin is earthen with the west basin having an effective area of 1.1 acres and the east basin 2.6 acres. Each basin will be able to contain a 10-year 24-hour storm runoff for those areas specified (east basin, 1.5 M gal. & west basin, 1.2 M gal.). In addition, the east basin is sized for processing the floor drain waste effluent. The discharge of each basin will pass through a corrugated plate oil separator (16CR104-D & 16CR105-D) followed by an oil coalescer/pre-filter package system (16CR107-F & 16CR108-F). This equipment is designed to reduce the oil discharge, free and emulsified, to 15 mg/l and the suspended solids to 15 mg/l.

Coal Pile Runoff System

Rainfall runoff from the coal pile will be collected in an earthen coal pile runoff collection basin (16CR107-N). The runoff will be collected by a gravity and berm system (sketch 5082-SKC-7). The influent to the basin will be treated with an anionic polymer to enhance settling and removal of suspended solids. The basin is sized (1.3 acres) to allow for reduction of suspended solids to 15 mg/l. The volume of the coal pile will contain the 10-year 24-hour storm, 1.08×10^6 gallons. The pond will be equipped with a belt type oil skimmer (16CR103-F) in case some oil from coal grooming equipment, coal handling building sumps, or dust suppressants makes its way to the pond. The effluent from the basin will be pumped to the south ditch. However, if the blowing coal fines that enter the basin do not settle out, the effluent can be sent through a disposable type filter (16CR104-F) for final solids reduction.

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Discharge Locations

The following lists the discharge locations scaled from the USGS; Topographic Map, Zion Quadrangle, Illinois Wisconsin, 7.5-minute series, photo revised 1972:

Discharge No.	Discharge Treated Waste	Location
001	Ash Transport Blowdown Gas Side Cleaning Wash	42°22'58" Latitude 87°48'47" Longitude
002	Demineralizer Regenerant	42°23'00" Latitude 87°48'46" Longitude
003	East Yard Runoff Floor Drains	42°23'01" Latitude 87°48'37" Longitude
	West Yard Runoff Coal Pile Runoff	42°22'33" Latitude 87°49'04" Longitude

Although Discharge No. 003 represents two distinct locations, these wastes are similar in nature and should be assumed as one average discharge.

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PRELIMINARY REPORT

WASTEWATER POLLUTION CONTROL
SYSTEMS AND CONCEPTUAL DESIGNS

FOR

COMMONWEALTH EDISON COMPANY
WAUKEGAN STATION
WAUKEGAN, ILLINOIS

PREPARED BY

CYRUS WM. RICE DIVISION
NUS CORPORATION
1910 COCHRAN ROAD
PITTSBURGH, PENNSYLVANIA 15220

CLIENT NO. 6523

DATED: NOVEMBER 1975

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I. INTRODUCTION

This report presents a summary of the work performed by the Cyrus Wm. Rice Division of NUS Corporation in the appraisal and study of the wastewater pollution control facilities at the Waukegan Station of Commonwealth Edison Company. It outlines systems and conceptual designs for modifications and additions required for future compliance with the wastewater chemical and physico-chemical limitations as presently established by the Federal Environmental Protection Agency and the Illinois Pollution Control Board.

The report has been prepared in an abbreviated form, and includes discussion of alternative solutions to specific problems but not the complete development of the rationales of the solutions included, in order that the critical time schedule involved may be fully accommodated.

Preliminary cost estimates are included in a separate report.

This work was undertaken in response to authorization received by NUS on April 22, 1975 and confirmed in Commonwealth Edison Purchase Order 802670.

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II. GENERAL

The general drawings referred to in the individual sections of this report are listed below and included in this Section. Additional drawings are included in a separate appendix.

6523-2A1 - Location of Major Equipment

6523-2A2 - Main Building, Equipment and Drain Collection Arrangement

6523-5A5 - Proposed Wastewater Flow Diagram

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III. FLY ASH HANDLING

A. DISCUSSION

Fly ash from the economizer hoppers of Units 7 and 8 is now sluiced to the dewatering bins. In addition to producing a contribution to undesirable wastewater contamination, this procedure is judged to be responsible for frequent malfunction of the dewatering bins. Were it to be converted to dry handling for transport to the existing silo serving precipitator fly ash systems, the probability is that the silo unloading facility would be affected adversely.

B. DESCRIPTION

It is proposed that the system be converted to dry gravity flow to a collection tank, from which it will be sluiced directly to the ash pond (if the basic bottom ash handling system as proposed is installed), or to the bottom ash sluice water system (if the alternate bottom ash handling system is installed).

C. EQUIPMENT LISTS

1. Use With Basic Bottom Ash System

Items	Service	Estimate Basis
1. Piping	Econ. hoppers to collection tank	500'-6" alloy steel
2. Tank	Collects econ. hoppers fly ash for temporary storage	1-7800 gal. steel

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Items	Service	Estimate Basis
3. Pumps	Sluice from Item 2 to ash pond	2-ea., 150 gpm, 40' TDH
4. Piping	From Item 3 to ash pond	1500'-6" steel

2. Use With Alternate Bottom Ash System

Items	Service	Estimate Basis
1. Piping	Econ. hoppers to collection tank	500'-6" alloy steel
2. Tank	Collects econ. hoppers fly ash for temporary storage	1-7800 gal. steel
3. Pumps	Sluice from Item 2 to surge sump of bottom ash sluice system	2-ea., 150 gpm, 40' TDH
4. Piping	From Item 3 to surge sump of bottom ash sluice system	1000'-6" steel

D. DRAWINGS

6523-5A5 (Basic System)

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IV. BOTTOM ASH HANDLING

A. DISCUSSION

The present ash ponds are of sufficient size. Seepage and percolation from them is not acceptable, but exists. The present ash sluice systems for Units 7 and 8 are inoperative, and require extensive modification.

B. DESCRIPTION

1. Basic System

The system proposed utilizes the existing ash pond, which will be concrete lined to eliminate seepage and percolation. Bottom ash sluice from Units 5 and 6 will continue to go direct to the pond, but slag tanks overflow will go to a new overflow tank for Unit 7. Bottom ash sluice from Units 7 and 8 will continue to go to the existing dewatering bins, but ash hoppers overflow will go to new overflow tanks. The water from the two new overflow tanks and from the dewatering bins will be collected in the new main collection tank, from which it will be pumped to the ash pond. Water from the ash pond will be clarified and returned to the ash sluicing system, with the blowdown filtered and discharged to the lake.

2. Alternate System

The system proposed does not utilize an ash pond. Bottom ash sluice will go to a new dewatering

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bin for Unit 5, to existing dewatering bins for Units 7 and 8, and to three new dewatering bins for Unit 6. Overflow from slag tanks for Unit 6 and from ash hoppers for Units 7 and 8 will go to new overflow tanks, from which it will be pumped to a new cooling tower. A new baffled surge sump will collect cooling tower effluent, and underflow and overflow from all six dewatering bins. The contaminated water from this sump will pass through clarifiers for return to the sluice water system. Blowdown will be filtered and discharged to the lake.

C. EQUIPMENT LIST

1. Basic System

Items	Service	Estimate Basis
1. Tanks	Collect Unit 6, 7 & 8 overflows from slag tanks, ash hoppers, and head tanks	2-6000 gal. steel
2. Piping	Network to deliver overflows to Item 1	500'-8" steel
3. Piping	Network to collect filter and strainer backwash and deliver to Item 1	1000'-6" steel
4. Pumps	Ash overflow from Item 1	4-750 gpm, 50' TDH
5. Piping	To and from Item 4 to Item 6	1000'-8" steel
6. Tank	Main collection tank for dewatering bins, hopper overflows, and backwash	1-300,000 gal. steel

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Items	Service	Estimate Basis
7. Pumps	From Item 6 to ash pond	3-2000 gpm, 40' TDH
8. Piping	To and from Item 7 to ash pond	2000'-12" steel
9. Pump House	To house Item 7	20'x25'x12', concrete block
10. Ash Pond Lining	Prevent seepage and percolation from ash pond	640,000 sq. ft., 6" reinforced concrete lined
11. Pumps	Lift water from slag pond to Item 14	2-3000 gpm, 30' TDH
12. Lift Station	At ash pond for Items 11	20'x20'x12', concrete box
13. Piping	To and from Item 12 to Item 14	2000', 12" steel
14. Clarifiers	Remove suspended solids remaining after ash pond settling	2-88' diam. clarifiers w/floc wells
15. Pumps	Pump Item 14 underflow to Item 22	4-150 gpm, 60' TDH
16. Piping	To and from Item 15 to misc. drains thickener	100', 12" steel
17. Sump	Collect clarifiers overflow	30,000 gal., concrete
18. Pumps	Return water to sluice system	2-3000 gpm, 150' TDH
19. Piping	Return network from Item 18	1000', 10" steel
20. Tank Relocation	Existing tank to serve as head tank for Units 5 and 6 ash sluice pumps	Time and material

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Items	Service	Estimate Basis
21. Piping	Head tank overflows to overflow tanks (Item 1)	500', 10" steel
22. Thickener	Thicken solids from all station clarifiers	1-40' diam. thickener, steel
23. Pumps	Pump Item 22 underflow to Item 24	2-75 gpm, 50' TDH
24. Filters	Precoat filters for sludge dewatering	2-12' diam. x 12', complete with vacuum and precoat systems
25. Building	House filters (Item 24) and waste controls	100'x50'x2 stories
26. Filters	Pressure filters for control of blowdown water quality	3-8' diam. filters w/automatic controls
27. Piping	Misc. connections	1000'-6" steel

2. Alternate System

Items	Service	Estimate Basis
1. Tanks	Collect Unit 6, 7 & 8 overflows from slag tanks and ash hoppers	2-6000 gal. steel
2. Piping	Network to deliver overflows and filter and strainer backwash to Item 1	700'-8" steel 1000'-6" steel
3. Piping	Miscellaneous connections	1000'-6" steel
4. Pumps	Ash overflow from Item 1	4-750 gpm, 50' TDH
5. Piping	To and from Item 4 to Item 6	1000'-8" steel

Items	Service	Estimate Basis
6. Cooling Tower	Remove heat from ash overflow system	1-cooling tower, 1500 gpm, 75° WB, 20° approach 20° ΔT
7. Dewatering Bins	One for Unit 5, three for Unit 6	4-150 ton/day bins
8. Piping	From Units 5 and 6 to Item 7	1000'-8" Ashcolite
9. Sump	Baffled surge sump	1-200,000 gal. concrete below grade
10. Piping	From Item 6 and six dewatering bins to Item 9	1000'-12" steel
11. Pumps	Feed water to clarifier	2-3000 gpm, 30' TDH
12. Piping	From Item 9 to Item 13	200'-12" steel
13. Clarifiers	Remove suspended solids from a sidestream off Item 9	2-62'-diam. steel w/floc well
14. Alum Feed System	Add flocculant to Item 13	1-alum feed system
15. Piping	Overflow return from Item 13 to Item 9	200'-20" steel
16. Pumps	Sluice water return to sluice system at low pressure from Item 9	4-2500 gpm, 150' TDH
17. Piping	Return network to all units from Item 16	1000'-10" steel
18. Pumps	Pump Item 13 underflow to Item 20	4-150 gpm, 60' TDH
19. Piping	To and from Item 18 to Item 20	100'-12" steel
20. Thickener	Thicken solids from all station clarifiers	1-40' diam. thickener, steel

Items	Service	Estimate Basis
21. Piping	Overflow of Item 20 to Item 9	200'-8" steel
22. Pumps	Pump thickener underflow to Item 24	2-75 gpm, 50' TDH
23. Piping	To and from Item 22 to Item 24	200'-4" steel
24. Filters	Precoat filters for sludge dewatering	2-12' diam. x 12', complete with vacuum and precoat systems
25. Building	House filters, Items 24 and 26, and waste controls	100'x50'x2 stories
26. Filters	Pressure filters for control of blowdown water quality	2-8' diam. filters, w/automatic controls

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V. DEMINERALIZERS

A. DISCUSSION

The Federal EPA requires only neutralization of demineralizer wastes prior to discharge, but the Illinois PCB has made an additional issue of the high dissolved solids involved in these wastes (7,500-10,000 ppm). In negotiations that have occurred concurrently with this work, Commonwealth Edison has determined that the PCB will accept a pH range of 6 to 9 combined with a dissolved solids reduction to the 3,500 ppm level.

Calculations show that with hydrochloric acid regeneration in place of sulfuric acid, revised regeneration schedules, high quality water (where available) recycle through the demineralizers, the addition of weak acid cation units at the head ends of the demineralizer trains, and the use of large volume neutralization-regenerant waste accumulator tanks, the 3,500 ppm level is attainable.

It has been determined that space requirements for the weak cation additions can be met.

B. DESCRIPTION

1. Demineralizer Mode

It is proposed that an additional demineralizer be installed and that existing demineralizers be converted to the HCl mode. It is further proposed

that weak cation units be added to the head end of each demineralizer train.

2. Neutralization System

The proposed system will collect and neutralize all regenerant wastes. This will be a batch treatment facility with retention capacity for approximately two days storage of regenerant wastes. Most of the acidity and alkalinity will be neutralized by blending; the balance will be pH corrected with automatic acid or caustic addition.

C. EQUIPMENT LIST

Items	Service	Estimate Basis
1. Demineralizer	Boiler water treatment	300 gpm capacity, with decarbonator, 3-100 gpm sand filters, and alum and polyelectrolyte feed system
2. Tank	HCl storage	15,000 gal. rubber lined steel, with dike
3. Pumps	HCl to demineralizers	2-double-check diaphragm
4. Piping	To and from Item 3 to demineralizers	350'-1" saran lined steel
5. Tanks	Weak acid resin before demineralizers	2-ea. for 85 cu. ft. IRC-84 resin
6. Piping	From Item 5 to demineralizers	20'-4" steel 20'-1½" saran lined steel

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2. Neutralization System

Items	Service	Estimate Basis
1. Piping	Transport of regenerant waste from Units 2 and 3 kinghole to neutralization tank	450', 4" saran lined
2. Piping	Transport of caustic	525', 1" steel
3. Piping	Transport of acid	650', 1" CPVC
4. Pumps	Transport of caustic and acid	2-double check liquid coupled diaphragm pumps
5. Tank	Neutralization	1-150,000 gal. lined tank, 30' diam.
6. Pump	Mixing for Item 5	1-1000 gpm, 50' TDH
7. Piping	Interconnect pH controller with Items 4-6	1-lot
8. Piping	Discharge to intake canal	40'-6" steel

D. DRAWINGS

6523-2A2

6523-5A5

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VI. REUSE, HIGH QUALITY WATER

A. DISCUSSION

The recovery of substantial quantities of low dissolved solids boiler water, often wasted through boiler blowdown and boiler drainage, can result in a reduced requirement for demineralizer regenerant chemicals, and therefore in a reduction in the total quantity of regenerant wastes that are discharged to receiving waters.

B. DESCRIPTION

It is proposed that boiler drains, blowdown, and sample water, from Units 7 and 8, be collected in a storage tank for later introduction into the makeup demineralizers along with the raw water, after the recovered water is cooled to a temperature such that the combined demineralizer feed temperature will not exceed 120°F. The volume of these flows indicates a need for a steam separator or flash tank and heat exchanger.

C. EQUIPMENT LIST

Items	Service	Estimate Basis
1. Piping	Collect blowdown from Boilers 7 & 8 and deliver to Item 2	200'-2" steel
2. Separators	Flash blowdown to atmospheric or suitable intermediate pressure and vent steam	2-100 gpm separators
3. Piping	Deliver water from Item 2 to Item 4	400'-2" steel

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Items	Service	Estimate Basis
4. Tank	Storage of blowdown, boiler drainage, and sample water	1-150,000 gal. steel
5. Pumps	Boost boiler drains to Item 4	2-200 gpm, 50' TDH
6. Piping	Collection network to and delivery line from Item 5 to Item 4	800'-4" steel
7. Piping	Collection of sample water at sample sinks for gravity delivery to Item 4	1000'-2" steel
8. Pumps	Total flow from Item 4 to heat exchanger	2-100 gpm, 250' TDH
9. Heat Exchanger	Cool as required Item 8 discharge	1-100 gpm
10. Piping	From Item 4 through Items 8 and 9 to the demineralizer filters inlet	450'-4" steel

D. DRAWINGS

6523-2A1

6523-5A5

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VII. RAINFALL RUNOFF

A. DISCUSSION

The proposed control measures are designed to meet the quality requirements of the State of Illinois regulations and the runoff volume requirements of federal regulations as they pertain to material storage. In addition to this, provision is made for retention and treatment of EPA-specified volume of plant and yard area runoff for suspended solids and oil contamination. All areas, including the coal pile, have been assigned a runoff coefficient of 1.0.

B. DESCRIPTION

1. Roof and Yard Runoff

The proposed system will collect runoff from the active plant area immediately surrounding the main building, and from the main switch yard. The runoff will be held in a concrete basin and metered to the bilge and floor drain system.

2. Coal Pile Runoff

The proposed system will prevent intrusion to, and direct discharge of runoff from, the coal pile area. Runoff will be diverted to a concrete lined basin. Supernatant from the basin will be discharged while the remaining coal sludge will be returned to the coal pile.

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C. EQUIPMENT LIST

1. Roof and Yard Runoff

Items	Service	Estimate Basis
1. Piping	Collect northeast yard drainage and deliver to Item 2	1000'-10" concrete, 3 yard drains
2. Sump	For Lift Station No. 1 (N.E. yard drains)	15,000 gal., concrete
3. Pumps	For Item 2	4-1500 gpm, 50' TDH
4. Piping	Collect precipitator area runoff	750'-10" concrete
5. Sump	For Lift Station No. 2 (precipitator area runoff)	8000 gal., concrete
6. Pumps	For Item 6	2-800 gpm, 50' TDH,
7. Piping	Collect south yard area runoff	1000'-10" concrete, 2 yard drains
8. Sump	For Lift Station No. 3 (dewatering bin area runoff)	7500 gal., concrete
9. Pumps	For Item 8	2-300 gpm, 50' TDH
10. Pump	Additional pump for Units No. 3 and 4 crib house bilge which will serve as Lift Station No. 4	1-250 gpm, 50' TDH
11. Piping	Collection network for station roof drains	2000'-8" steel 200'-18" steel
12. Basin	Collect and retain roof and yard runoff	3,000,000 gal., concrete lined
13. Pumps	Discharge from Item 12 to the bilge and floor drain system	2-250 gpm, 50' TDH

Items	Service	Estimate Basis
14. Piping	From Item 13 to the bilge and floor drain system	450'-8" steel
15. Curb and Culvert	To control runoff in vicinity of dust silo	100'-6" curb and grating
16. Piping	From Item 15 to Item 2	300'-10" concrete
17. Curb and Drainage Trench	Collect main switchyard area runoff	3000'-curb and culvert
18. Piping	From Item 17 to Item 12	100'-30" concrete
19. Piping	Network to collect Lift Station discharges and deliver to Item 12	200'-6" steel 500'-12" steel 500'-16" steel 450'-18" steel 500'-30" concrete

2. Coal Pile Runoff

Items	Service	Estimate Basis
1. Curb	Control coal pile area runoff and divert to Item 2	2600'-curb, 18" above ground
2. Collection Basin	Collect and provide solids separation for coal pile runoff	2,300,000 gal., concrete lined
3. Pumps	Discharge supernatant from Item 2 to stream north of ash pond	2-500 gpm, 50' TDH
4. Piping	For Item 3	50'-10" steel
5. Pumps	Return coal sludge to coal pile	2-50 gpm, 50' TDH
6. Piping	For Item 5	450'-6" steel

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D. DRAWINGS

6523-2A1
6523-5A5

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VIII. METAL CLEANING WASTES

A. DISCUSSION

1. Gas-Side

Gas-side washing is practiced at varying time intervals according to local and boiler-specific requirements. The wastewaters from these washing operations can contain suspended solids and many different constituents that are dissolved from the ash deposits involved. The pH of the washings can be alkaline or acid, depending on coal ash characteristics, point of origin within the boiler, concentration of various ash constituents dissolved in the water, and boiler design.

Very large volumes of wash water are required in many cases to insure maximum cleanliness.

2. Water-Side (Boiler Tube Cleaning)

Commonwealth Edison is currently committed to the use of ammoniated EDTA for the water-side chemical cleaning of fossil-fueled boilers on a system-wide basis. It is accepted standard practice to collect the waste acid and to pump it at a low controlled rate into an operating boiler furnace. This process should be acceptable for long-term application as long as it is properly controlled.

The use of inhibited hydrochloric acid, with or without copper chelants, may possess advantages

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under certain circumstances. NUS suggests that this cleaning solution, properly neutralized (sodium hydroxide) and discharged under proper control into an operating boiler furnace of adequate size over a long period of time (3-4 weeks), can be handled in the same manner as the EDTA solution. The significant control parameter is the rate of addition of sodium chloride to the furnace in relation to the sodium and chloride normally found in the coal, as fired. The addition of sodium chloride at a rate of 0.01% NaCl on a coal basis should not cause additional ash deposition or gas-side corrosion difficulties.

B. DESCRIPTION

1. Gas-Side

It is proposed that the pH of the entering wash water be adjusted by means of a sodium bicarbonate buffer solution introduced from a new 3000 gal. tank, so that the wastewater pH will be in the range of 8.0. This is for the case in which the wastewater is acidic without adjustment. When the wastewater is alkaline without adjustment, with a pH above 9.0, the pH adjustment will be accomplished by adding mineral acid to the neutralization tank during recirculation from this tank. The settled solids will be trucked off site, and the supernatant will be carried direct to the intake canal, or indirectly to the roof and yard runoff collection basin, depending on effluent quality.

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2. Water-Side

It is proposed that the present organic solvent chemical cleaning and solvent disposal practices will be followed as long as satisfactory results are obtainable. It is proposed that a new 150,000 gal. tank be furnished, with appurtenances, for use in lieu of the Contractor's tank trucks, for retention prior to injecting the waste acid to the furnace. Should it become necessary to change to an inhibited hydrochloric acid solvent for special problem boiler tube cleaning jobs, disposal of the neutralized acid can be accomplished by adequately controlled furnace injection. For HCl cleaning, the retention tank size should be doubled to accommodate the alkaline flush wastes associated with HCl.

C. EQUIPMENT LIST

The following items are proposed for the water-side (boiler tube cleaning) discharge:

Items	Service	Estimate Basis
1. Piping	Collection network	1000'-8" steel
2. Tank	Retention of wastes	1-150,000 gal., 30' diam., steel
3. Pumps	Deliver wastes from Item 2 to boiler	2-ea. 30 gpm, 150' TDH
4. Piping	From Item 2 to 3 to operating boiler (one of two)	500'-3" steel

The following items are proposed for addition of buffer solution for the gas-side cleaning. Wastes generated during this cleaning will be collected in a new tank.

Items	Service	Estimate Basis
1. Tank	Contain buffer solution	3000 gal. steel, open top
2. Mixer	Mix buffer solution	1 hp mixer
3. Piping	Deliver buffer solution from Item 1 to air heaters	Copper and brass piping and valves
4. Pump	Pump solution from Item 1 to air heaters	Metering pump
5. Flow Meter	Monitor flow rate of buffer solution	Float-type meter
6. Piping	Collection network for gas-side washings	1500'-6" steel
7. Tank	Neutralization and settling of gas-side washings	1-150,000 gal. steel
8. Pump	Recirculation mixing of Item 7	1-2000 gpm, 50' TDH
9. Piping	From Item 7 to roof and yard runoff collection basin	100'-12" steel
10. Portable Instrumentation System	Provide tank-side monitoring	pH measurement equipment
11. Piping	Acid transfer	1500'-2" saran lined

D. DRAWINGS

6523-2A1

6523-5A5

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IX. BILGES AND FLOOR DRAINS

A. DISCUSSION

The control concerns in these wastewaters are suspended solids and oil.

B. DESCRIPTION

It is proposed that bilge and floor drain discharges be collected and sent to a surge sump which is followed by an oil separator and skimmer-equipped flocculator-clarifier. Clarifier overflow will be discharged to the lake. The underflow will be sent to the bottom ash sluice return system thickener for solids dewatering.

C. EQUIPMENT LIST

Items	Service	Estimate Basis
1. Bilge	Collect turbine and boiler room drains from Units 1-4 via old discharge tunnels	18,000 gal. concrete
2. Pumps	For Item 1	2-250 gpm, 50' TDH
3. Piping	From existing bilge in Unit 4 condenser pit to new demineralizer waste neutralization tank	200'-6" steel
4. Bilge	Collect Unit 5 boiler room floor drains	1400 gal., concrete
5. Pumps	For Item 4	2-50 gpm, 50' TDH
6. Piping	Reroute Unit 7 boiler room drains to tie in with existing lines to bilge on Unit 8 boiler room drains	200'-10" steel

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TABLE 1

COMMONWEALTH EDISON COMPANY
Waukegan Station

Approximate Flows and Characteristics of Wastewater

Item	Average Flows Gallons/Day	Origin	Significant Characteristics
Ash Transport System Blowdown	3.900×10^6	Bottom Ash Sluice Bottom Slag Sluice Economizer Sluice All Sluice Water is House Service Water	Suspended Solids
Demineralizer Filter Backwash	0.170×10^6	House Service Water	Suspended Solids
Gas Side Cleaning Waste System	1.600×10^6	Air Heater Wash Boiler Slope Wash Economizer Wash All Washes use House Service Water	Suspended Solids Dissolved Metals
Demineralizer Regenerant Washes	0.016×10^6	Acid Regeneration of Cation Units Caustic Regeneration of Anion Units Rinses using House Service Water	Low pH
Boiler Blowdown and Drains		Treated Demineralized Water Originates from Well	Not Discharged--Recycled
Contaminated Floor Drains	0.500×10^6	House Service Water	Oil & Suspended Solids
Contaminated Roof and Yard Runoff	2.700×10^6	Includes Switchyards, Peaker Area, Material Storage Area, Water-Cooled Transformer Water, Roofs, Crib House Drains, All Originate from Rainfall Runoff	Oil & Suspended Solids
Coal Pile Runoff	1.080×10^6	Coal Pile Rainfall Runoff	Oil & Suspended Solids

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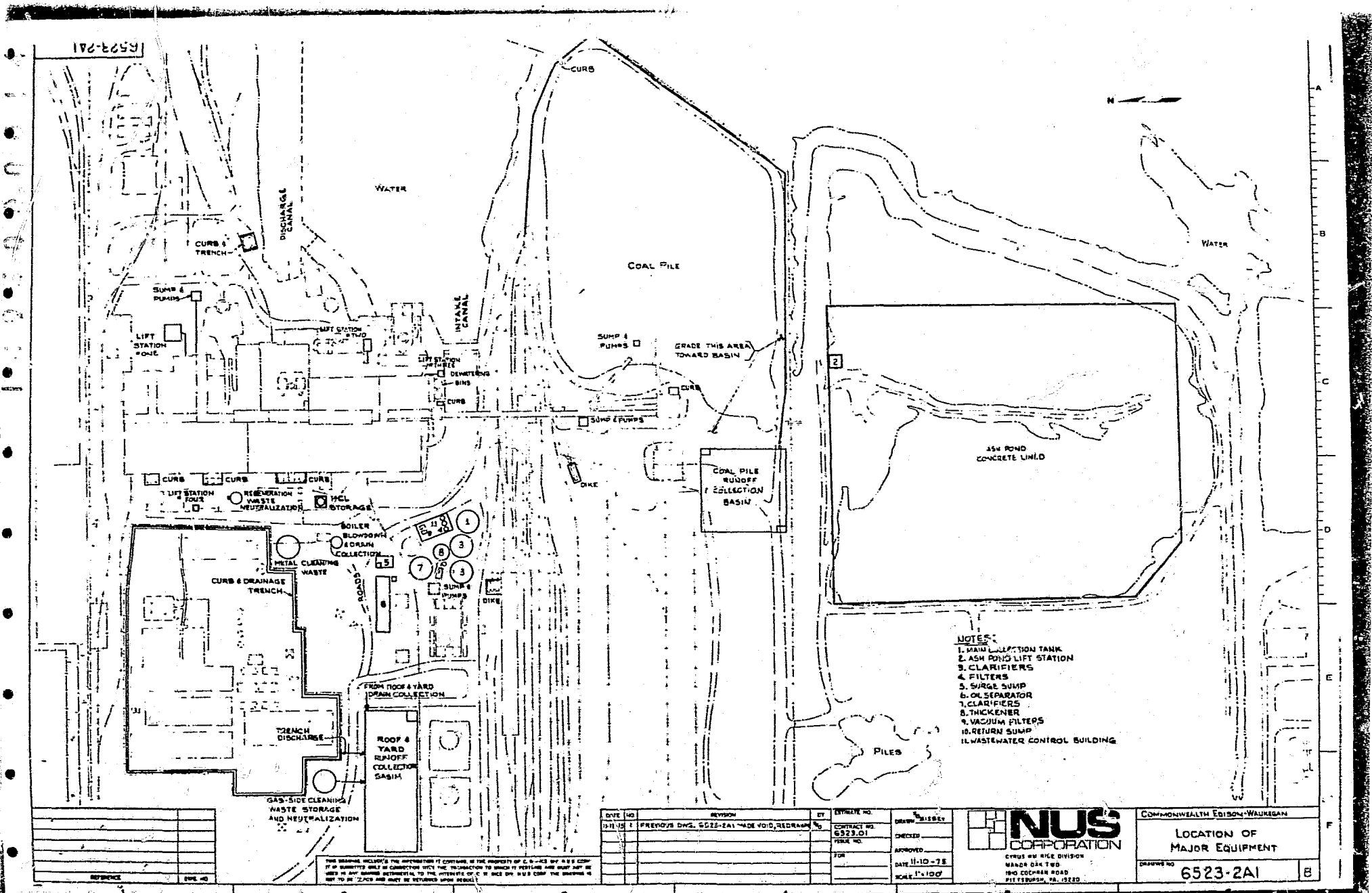


DATE	NO	REVISION	BY
11-11-75	1	PREVIOUS DWG. 6523-2A1 MADE VOID, REDRAWN	

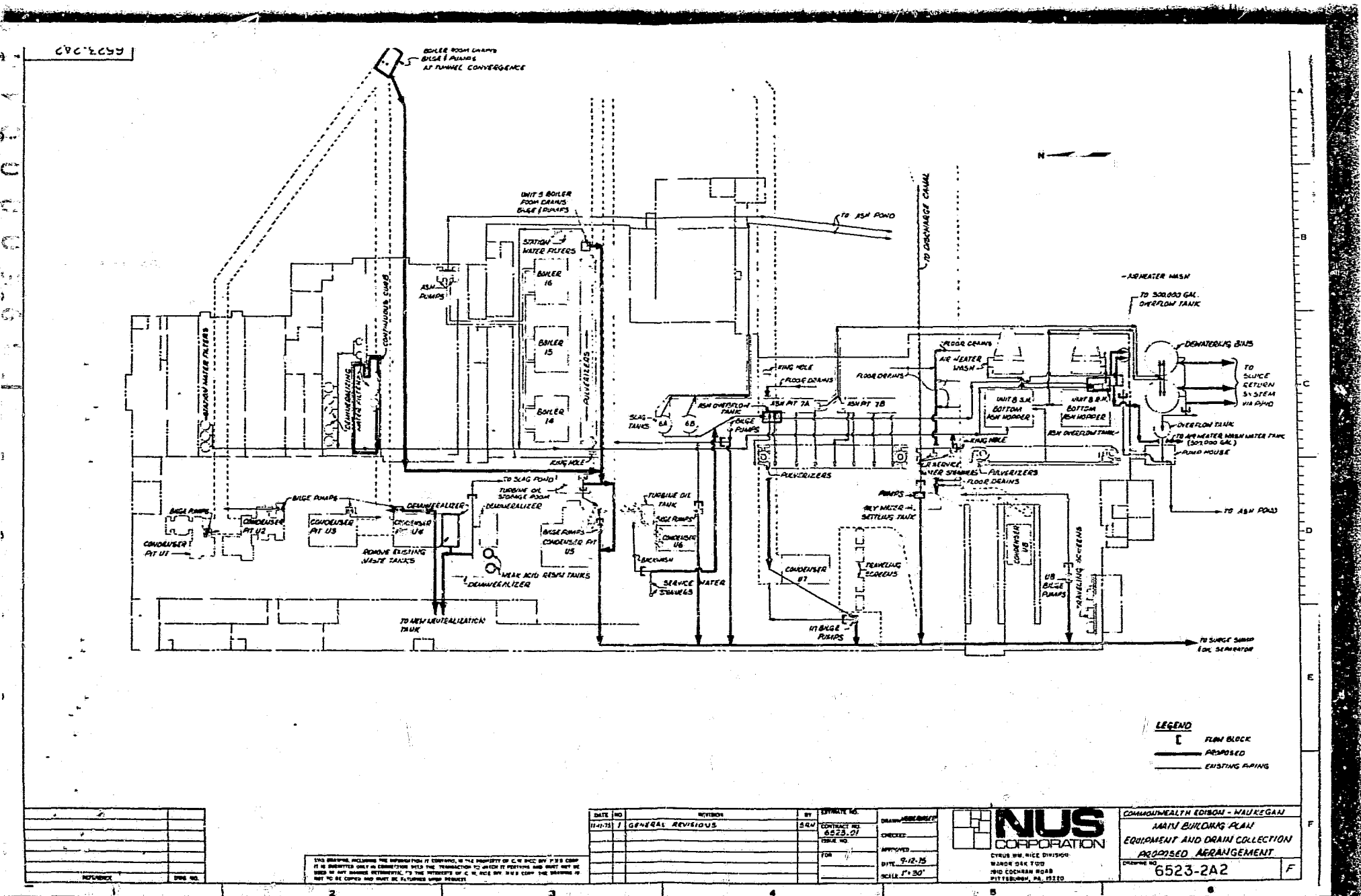
ESTIMATE NO.
CONTRACT NO. 6523.01
ISSUE NO.
FOR
DRAWN BISSEY
CHECKED
APPROVED
DATE 11-10-75
SCALE 1"=100'

NUS CORPORATION
CYRUS RHE RICE DIVISION
MANOR OAK TWO
1910 COCHRAN ROAD
PITTSBURGH, PA. 15220

COMMONWEALTH EDISON-WAUKEGAN

LOCATION OF MAJOR EQUIPMENT

DRAWING NO. 6523-2A1 8



DATE	NO	REVISION	BY
11-11-75	1	GENERAL REVISIONS	ASW

ESTIMATE NO.
CONTRACT NO. 6523.01
ISSUE NO.
FOR
DRAWN
CHECKED
APPROVED
DATE 9-12-75
SCALE 1"=30'

NUS CORPORATION
CYRUS WM. RICE DIVISION
WANOR OAK TOWN
910 COCHRAN ROAD
PITTSBURGH, PA. 15220

COMMONWEALTH EDISON - WAUKEGAN
MAIN BUILDING PLAN
EQUIPMENT AND DRAIN COLLECTION
PROPOSED ARRANGEMENT
DRAWING NO. 6523-2A2 F

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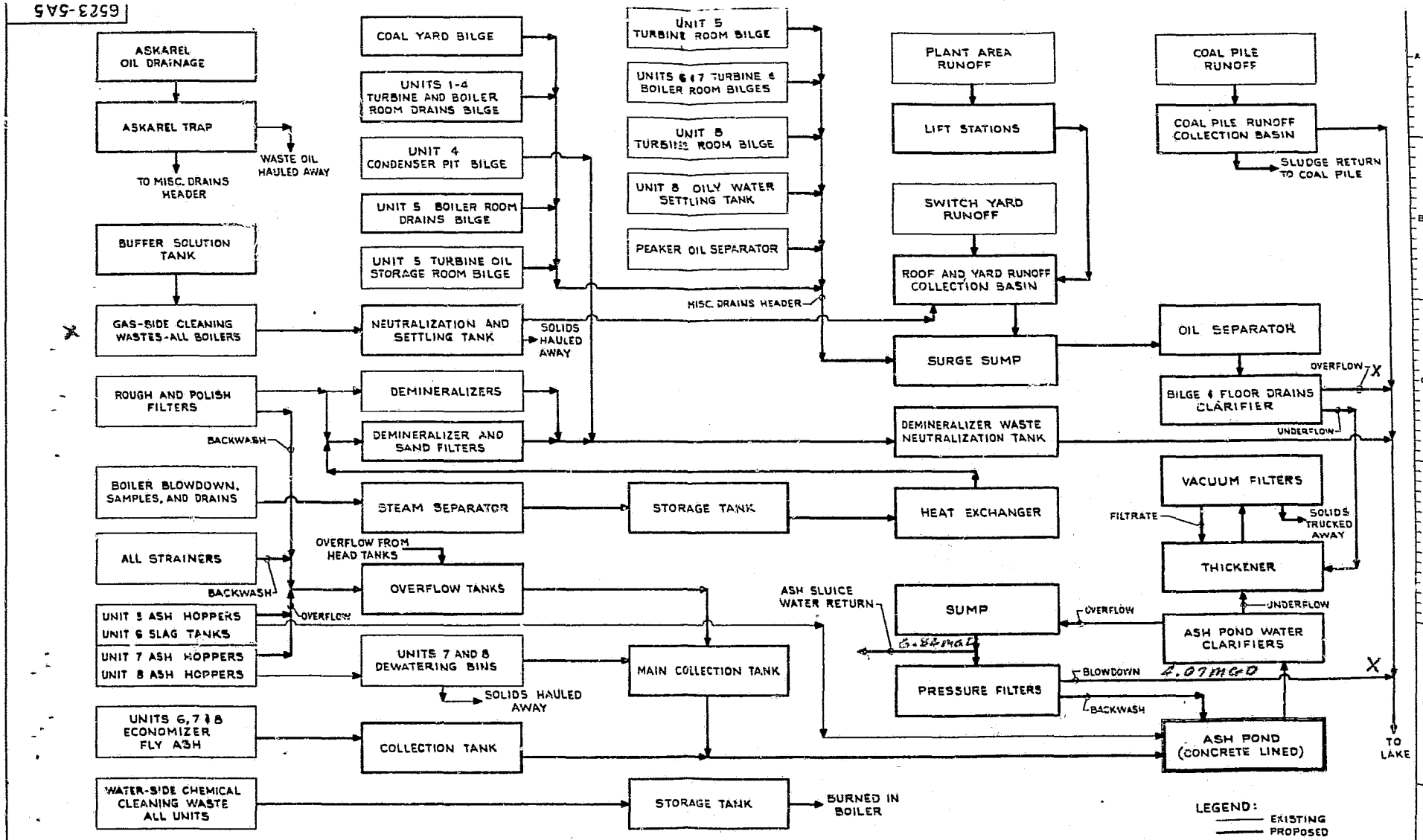

DATE	NO.	REVISION	BY
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ESTIMATE NO.
CONTRACT NO. 6529.01
ISSUE NO.
JOB
DRAWN BIESEY
CHECKED
APPROVED
DATE 11-18-75
SCALE —

NUS CORPORATION
CYRUS WM. RICE DIVISION
MANOR OAK TWO
910 COCHRAN ROAD
PITTSBURGH, PA. 15220

COMMONWEALTH EDISON-WAUKEGAN

PROPOSED WASTEWATER FLOW DIAGRAM

DRAWING NO. 6523-5A5 A

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VII. RAINFALL RUNOFF

A. DISCUSSION

The proposed control measures are designed to meet the quality requirements of the State of Illinois regulations and the runoff volume requirements of federal regulations as they pertain to material storage. In addition to this, provision is made for retention and treatment of EPA-specified volume of plant and yard area runoff for suspended solids and oil contamination. All areas, including the coal pile, have been assigned a runoff coefficient of 1.0.

B. DESCRIPTION

1. Roof and Yard Runoff

The proposed system will collect runoff from the active plant area immediately surrounding the main building, and from the main switch yard. The runoff will be held in a concrete basin and metered to the bilge and floor drain system.

2. Coal Pile Runoff

The proposed system will prevent intrusion to, and direct discharge of runoff from, the coal pile area. Runoff will be diverted to a concrete lined basin. Supernatant from the basin will be discharged while the remaining coal sludge will be returned to the coal pile.

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C. EQUIPMENT LIST

1. Roof and Yard Runoff

Items	Service	Estimate Basis
1. Piping	Collect northeast yard drainage and deliver to Item 2	1000'-10" concrete, 3 yard drains
2. Sump	For Lift Station No. 1 (N.E. yard drains)	15,000 gal., concrete
3. Pumps	For Item 2	4-1500 gpm, 50' TDH
4. Piping	Collect precipitator area runoff	750'-10" concrete
5. Sump	For Lift Station No. 2 (precipitator area runoff)	8000 gal., concrete
6. Pumps	For Item 6	2-800 gpm, 50' TDH,
7. Piping	Collect south yard area runoff	1000'-10" concrete, 2 yard drains
8. Sump	For Lift Station No. 3 (dewatering bin area runoff)	7500 gal., concrete
9. Pumps	For Item 8	2-300 gpm, 50' TDH
10. Pump	Additional pump for Units No. 3 and 4 crib house bilge which will serve as Lift Station No. 4	1-250 gpm, 50' TDH
11. Piping	Collection network for station roof drains	2000'-8" steel 200'-18" steel
12. Basin	Collect and retain roof and yard runoff	3,000,000 gal., concrete lined
13. Pumps	Discharge from Item 12 to the bilge and floor drain system	2-250 gpm, 50' TDH

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Items	Service	Estimate Basis
14. Piping	From Item 13 to the bilge and floor drain system	450'-8" steel
15. Curb and Culvert	To control runoff in vicinity of dust silo	100'-6" curb and grating
16. Piping	From Item 15 to Item 2	300'-10" concrete
17. Curb and Drainage Trench	Collect main switchyard area runoff	3000'-curb and culvert
18. Piping	From Item 17 to Item 12	100'-30" concrete
19. Piping	Network to collect Lift Station discharges and deliver to Item 12	200'-6" steel 500'-12" steel 500'-16" steel 450'-18" steel 500'-30" concrete

2. Coal Pile Runoff

Items	Service	Estimate Basis
1. Curb	Control coal pile area runoff and divert to Item 2	2600'-curb, 18" above ground
2. Collection Basin	Collect and provide solids separation for coal pile runoff	2,300,000 gal., concrete lined
3. Pumps	Discharge supernatant from Item 2 to stream north of ash pond	2-500 gpm, 50' TDH
4. Piping	For Item 3	50'-10" steel
5. Pumps	Return coal sludge to coal pile	2-50 gpm, 50' TDH
6. Piping	For Item 5	450'-6" steel

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D. DRAWINGS

6523-2A1
6523-5A5

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VIII. METAL CLEANING WASTES

A. DISCUSSION

1. Gas-Side

Gas-side washing is practiced at varying time intervals according to local and boiler-specific requirements. The wastewaters from these washing operations can contain suspended solids and many different constituents that are dissolved from the ash deposits involved. The pH of the washings can be alkaline or acid, depending on coal ash characteristics, point of origin within the boiler, concentration of various ash constituents dissolved in the water, and boiler design.

Very large volumes of wash water are required in many cases to insure maximum cleanliness.

2. Water-Side (Boiler Tube Cleaning)

Commonwealth Edison is currently committed to the use of ammoniated EDTA for the water-side chemical cleaning of fossil-fueled boilers on a system-wide basis. It is accepted standard practice to collect the waste acid and to pump it at a low controlled rate into an operating boiler furnace. This process should be acceptable for long-term application as long as it is properly controlled.

The use of inhibited hydrochloric acid, with or without copper chelants, may possess advantages

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under certain circumstances. NUS suggests that this cleaning solution, properly neutralized (sodium hydroxide) and discharged under proper control into an operating boiler furnace of adequate size over a long period of time (3-4 weeks), can be handled in the same manner as the EDTA solution. The significant control parameter is the rate of addition of sodium chloride to the furnace in relation to the sodium and chloride normally found in the coal, as fired. The addition of sodium chloride at a rate of 0.01% NaCl on a coal basis should not cause additional ash deposition or gas-side corrosion difficulties.

B. DESCRIPTION

1. Gas-Side

It is proposed that the pH of the entering wash water be adjusted by means of a sodium bicarbonate buffer solution introduced from a new 3000 gal. tank, so that the wastewater pH will be in the range of 8.0. This is for the case in which the wastewater is acidic without adjustment. When the wastewater is alkaline without adjustment, with a pH above 9.0, the pH adjustment will be accomplished by adding mineral acid to the neutralization tank during recirculation from this tank. The settled solids will be trucked off site, and the supernatant will be decanted direct to the intake canal, or indirectly to the roof and yard runoff collection basin, depending on effluent quality.

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2. Water-Side

It is proposed that the present organic solvent chemical cleaning and [illegible]nt disposal practices will be followed as long as satisfactory results are obtainable. It is proposed that a new 150,000 gal. tank be furnished, with appurtenances, for use in lieu of the Contractor's tank trucks, for retention prior to injecting the waste acid to the furnace. Should it become necessary to change to an inhibited hydrochloric acid solvent for special problem boiler tube cleaning jobs, disposal of the neutralized acid can be accomplished by adequately controlled furnace injection. For HCl cleaning, the retention tank size should be doubled to accommodate the alkaline flush wastes associated with HCl.

C. EQUIPMENT LIST

The following items are proposed for the water-side (boiler tube cleaning) discharge:

Items	Service	Estimate Basis
1. Piping	Collection network	1000'-8" steel
2. Tank	Retention of wastes	1-150,000 gal., 30' diam., steel
3. Pumps	Deliver wastes from Item 2 to boiler	2-ea. 30 gpm, 150' TDH
4. Piping	From Item 2 to 3 to operating boiler (one of two)	500'-3" steel

The following items are proposed for addition of buffer solution for the gas-side cleaning. Wastes generated during this cleaning will be collected in a new tank.

Items	Service	Estimate Basis
1. Tank	Contain buffer solution	3000 gal. steel, open top
2. Mixer	Mix buffer solution	1 hp mixer
3. Piping	Deliver buffer solution from Item 1 to air heaters	Copper and brass piping and valves
4. Pump	Pump solution from Item 1 to air heaters	Metering pump
5. Flow Meter	Monitor flow rate of buffer solution	Float-type meter
6. Piping	Collection network for gas-side washings	1500'-6" steel
7. Tank	Neutralization and [illegible]ling of gas-side washings	1-150,000 gal. steel
8. Pump	Recirculation mixing of Item 7	1-2000 gpm, 50' TDH
9. Piping	From Item 7 to roof and yard runoff collection basin	100'-12" steel
10. Portable Instrumentation System	Provide tank-side monitoring	pH measurement equipment
11. Piping	Acid transfer	1500'-2" saran lined

D. DRAWINGS

6523-2A1

6523-5A5

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IX. BILGES AND FLOOR DRAINS

A. DISCUSSION

The control concerns in these wastewaters are suspended solids and oil.

B. DESCRIPTION

It is proposed that bilge and floor drain discharges be collected and sent to a surge sump which is followed by an oil separator and skimmer-equipped flocculator-clarifier. Clarifier overflow will be discharged to the lake. The underflow will be sent to the bottom ash sluice return system thickener for solids dewatering.

C. EQUIPMENT LIST

Items	Service	Estimate Basis
1. Bilge	Collect turbine and boiler room drains from Units 1-4 via old discharge tunnels	18,000 gal. concrete
2. Pumps	For Item 1	2-250 gpm, 50' TDH
3. Piping	From existing bilge in Unit 4 condenser pit to new demineralizer waste neutralization tank	200'-6" steel
4. Bilge	Collect Unit 5 boiler room floor drains	1400 gal., concrete
5. Pumps	For Item 4	2-50 gpm, 50' TDH
6. Piping	Reroute Unit 7 boiler room drains to tie in with existing lines to bilge on Unit 8 boiler room drains	200'-10" steel

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Items	Service	Estimate Basis
7. Piping	Reroute Unit 8 turbine and boiler room drains to Item 8	200'-10" steel
8. Pumps	Convert oily water separator to a bilge	2-100 gpm, 50' TDH
9. Pumps	Convert peaker oil separator to a bilge	2-100 gpm, 50' TDH
10. Bilge	Collect existing coal yard bilge discharges	2500 gal., concrete
11. Pumps	For Item 10	2-250 gpm, 50' TDH
12. Piping	Network to collect all bilge discharges for delivery to Item 13	4100'-6" steel 900'-8" steel
13. Sump	Surge leveling	60,000 gal., concrete
14. Pumps	For Item 13	2-1000 gpm, 50' TDH
15. Piping	From Item 13 to Item 16	50'-16" steel
16. Oil Separator	Remove floating oil	1-270,000 gal. oil separator
17. Sump	Waste oil storage for Item 16	10,000 gal. concrete
18. Clarifier	Provide solids separation	1-65' diam. clarifier complete with floc. well and skimmer
19. Alum Feed System	Flocculant addition to Item 18	1-chemical feed system
20. Piping	From Item 16 to Item 18	100'-24" concrete
21. Piping	From Item 18 to intake canal	200'-24" concrete
22. Pumps	Pump clarifier underflow to bottom ash thickener	2-300 gpm, 50' TDH 1-150 gpm, 50' TDH

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Items	Service	Estimate Basis
23. Piping	For Item 22	250'-10" steel

C. DRAWINGS

6523-2A1
6523-2A2
6523-5A5

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X. TRANSFORMER SPILLS

A. DISCUSSION

Leakage and spills of the mineral oil or Askarel insulating fluids used in transformers and switchgear must be prevented from entering surface waters.

B. DESCRIPTION

The proposed system will prevent the discharge of oil spills and leaks. Included in the system are special provisions for collecting and separating Askarel.

C. EQUIPMENT LIST

Items	Service	Estimate Basis
1. Curb	Contain oil spills from Units 5 & 6 turbine oil storage tanks	300'-8" concrete curb
2. Piping	Reroute floor drain pipe from 12 KV main switchgear room to turbine room oil storage sump	50'-6" steel
3. Piping	Reroute Unit 6 turbine oil tank drain to the Unit 5 condenser sump	50'-6" steel
4. Curbs and Drains	Prevent, via toe plate, discharge of Askarel from precipitator rectifier transformers	800'-6" steel plate 18 drains
5. Curb	Prevent discharge of Askarel from main precipitator transformers	400'-6" concrete curb

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Items	Service	Estimate Basis
6. Curb	Prevent discharge of oil from south wall transformers	600'-6" concrete curb
7. Curb	Prevent discharge of oil from Unit 8 transformers	60'-6" concrete curb
8. Curb	Prevent discharge of oil from coal yard transformers	120'-6" concrete curb
9. Dike	Prevent discharge of oil from Unit 7 & 8 ignition oil tanks and coal handling equipment fuel oil tank	350'-24" earthen dike
10. Piping	Network to collect oil and water falling into Items 4 & 5 and deliver to Item 11	3000'-3" steel
11. Oil Trap	Separate and store up to 500 gal. of Askarel	1-500 gal. steel tank 1-36" sight glass
12. Sumps-Pumps	Collect oil-water drainage from electrical cable conduit	Concrete sumps 25 gpm pumps
13. Piping	O/F Item 11 to local bilge	80'-3" steel
14. Curb	Contain spills from Item 11	30'-24" concrete curb
15. Conductivity Alarm	Note presence of Askarel in trap	

D. DRAWINGS

6523-2A1

6523-5A5

XI. SCREENS AND STRAINERS

A. DISCUSSION

No problems have been noted at this Station with reference to this equipment or its operation.

B. DESCRIPTION

Installation of a light on the control panel is proposed. It will be timer-actuated to indicate collector basket dumping time schedule, and suitably interlocked.

C. EQUIPMENT LIST

Items	Service	Estimate Basis
Signal System	Collector Basket Dumping Schedule	Light, Timer, and Interlock

D. DRAWINGS

None

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XII. PEAKERS

A. DISCUSSION

Requirements for these units have been included under Bilges and Floor Drains.

B. DESCRIPTION

See Section IX.

C. EQUIPMENT

See Section IX.

D. DRAWINGS

6523-5A5

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XIII. ELECTRICAL REQUIREMENTS

A. DISCUSSION

The installation of the proposed pollution control equipment will add substantially to the electrical load at the Station. Existing circuits will not accommodate this load.

B. DESCRIPTION

A 4 KV feeder from Unit 7 or 8 auxiliary system will be provided to outdoor 4 KV switchgear and a step-down transformer for the 4 KV and 480 V load in the area of the wastewater control building.

Other miscellaneous loads distributed throughout the plant area are small. To supply these loads 480 V power feeders will be provided from distribution centers in the main building or breaker building to supply motor starter racks at the loads.

Controls will be housed in the wastewater control building southwest of the main building. This is to provide for central control and monitoring of all pollution control equipment. Alarm systems associated with these controls will be cross-connected with a warning light system in the central control room.

C. EQUIPMENT LIST

None

D. DRAWINGS

6523-2A1

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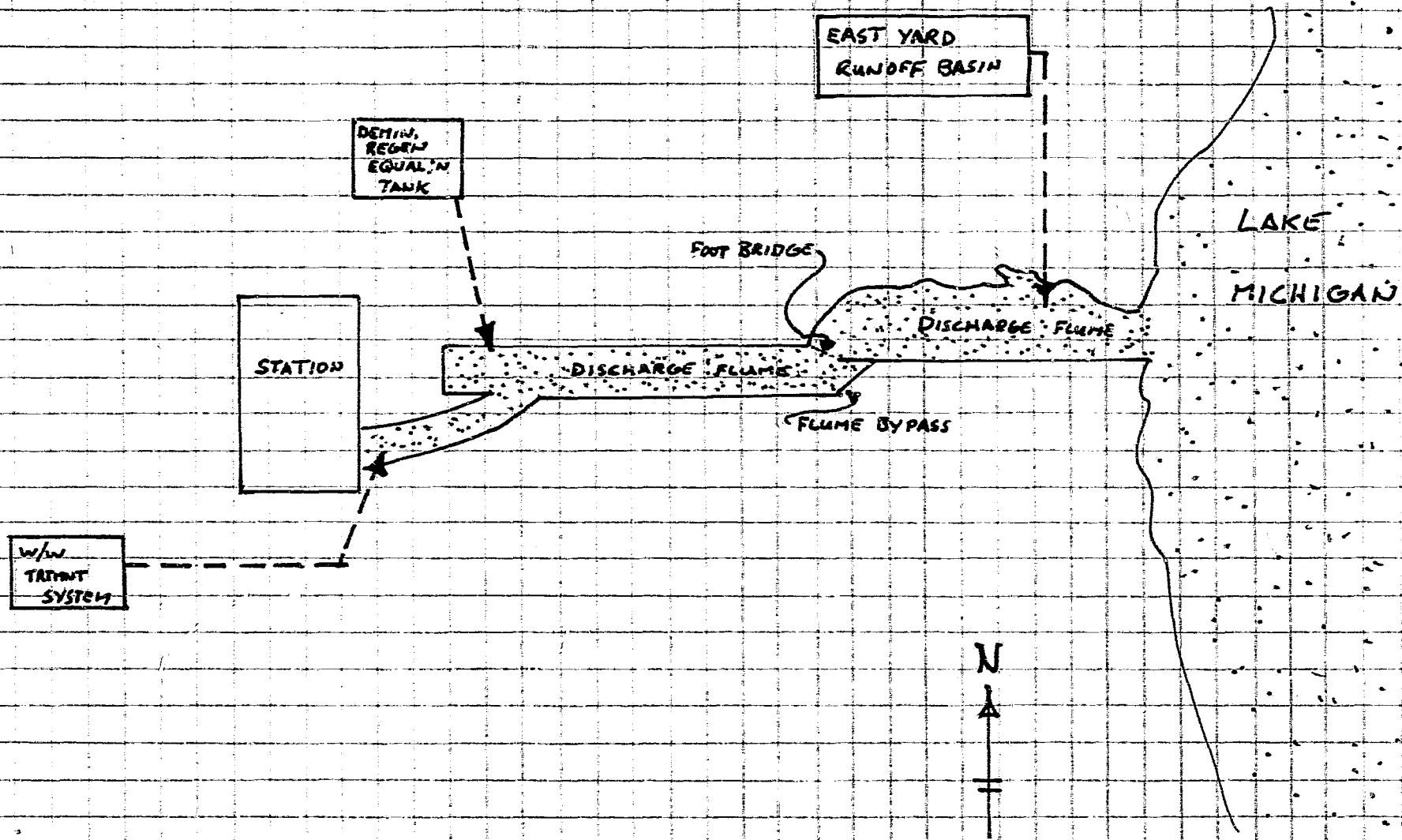
WASTEWATER FLOW SCHEMATIC of WAUKEGAN STATION



JPS/5/16/77

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TOTAL DISSOLVED SOLIDS and PHOSPHORUS

MASS BALANCE DIAGRAM FOR WAUKEGAN STATION

48240 gpm

CONDENSER COOLING WATER — FLOW: 181 MGD (MIN.) / 1036 MGD (MAX.)

LAKE MICHIGAN — FLOW: 168.6 MGD (MIN.) / 1014 MGD (MAX.)

Δ TDS:
14.1 PPM (MIN.)
87.5 PPM (MAX.)

DEMINERALIZER SYSTEM — FLOW: 0.08 MGD
TDS - 7815 PPM
P - 1.0 PPM .15 mg/l

Δ P: .003 mg/l
0.009 PPM (MIN.)
0.06 PPM (MAX.)
(.005) .005 mg/l

METAL CLEANING WASTE — FLOW: 1.75 MGD — Intermittent
TDS - 4776 PPM
P - 1.0 PPM .2 mg/l

BOTTOM ASH SYSTEM — FLOW: 4.37 MGD
TDS - 1235 PPM
P - 0.6 PPM

W/W TREATMENT SYSTEM
alum + polymers

BOILER BLOWDOWN — FLOW: 0.007 MGD
TDS - 700 PPM
P - 50 PPM 10 mg/l

EAST AREA RUNOFF
PLANT FLOOR DRAINS

EAST BASIN TRTMNT SYSTEM — FLOW: 1.08 MGD
TDS - 276 PPM*
P - 1.0 PPM +5 mg/l

Δ - INCREASE ABOVE BACKGROUND CONC.
MGD - MILLION GALLONS PER DAY
PPM - PARTS PER MILLION

* TDS CONCENTRATION ESTIMATE BASED ON POWERTON STATION

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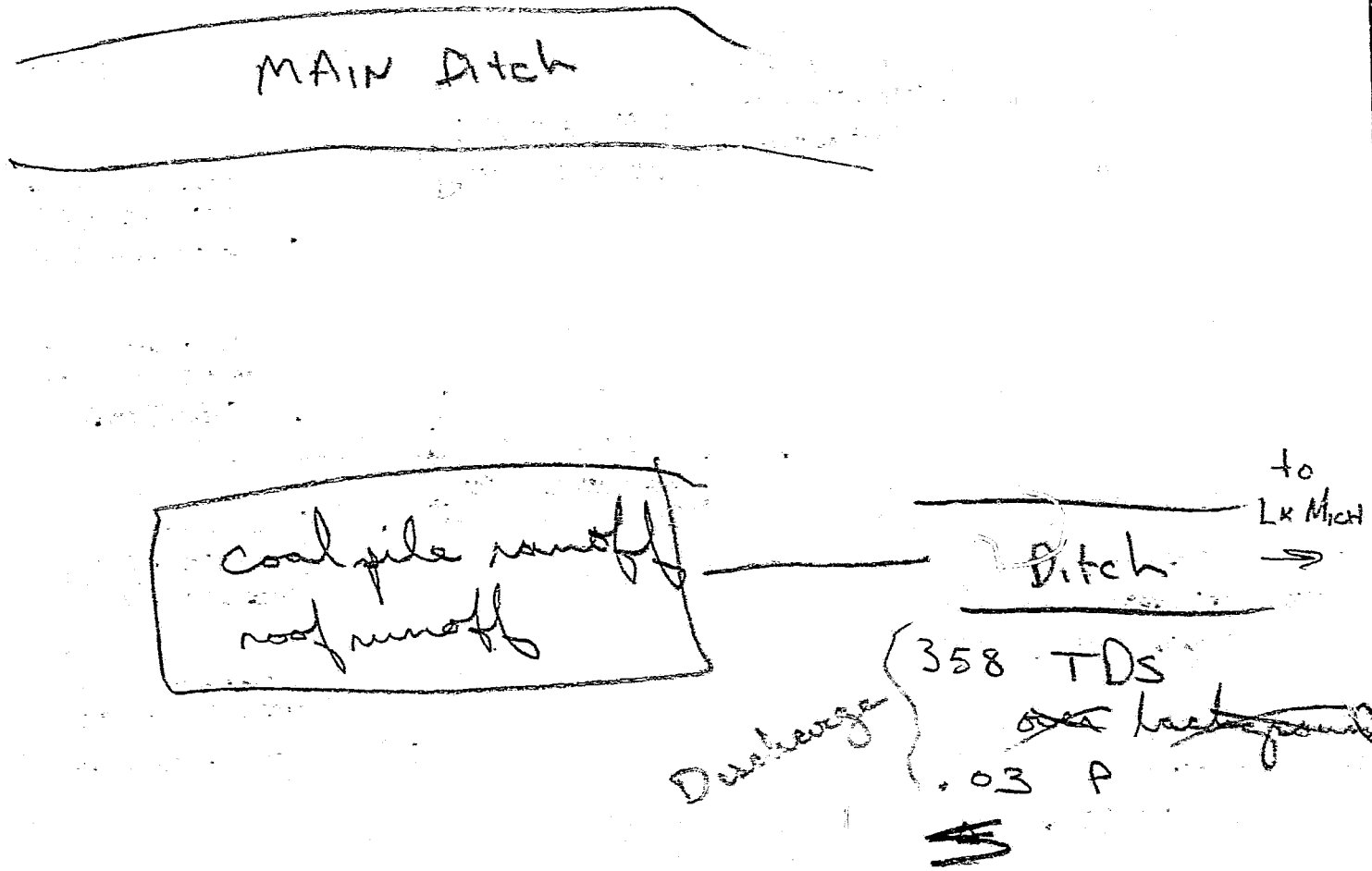

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Commonwealth Edison
72 West Adams Street, Chicago, Illinois
Address Reply to: Post Office Box 767
Chicago, Illinois 60690

October 24, 1979

HAND DELIVERED

Mr. Thomas G. McSwiggin
Manager, Permit Services - DWPC
Illinois Environmental Protection
Agency
2200 Churchill Road
Springfield, Illinois 62706

Subject: Joliet, Kincaid, Powerton, Ridgeland, Waukegan and Will County Stations -- Construction Plans and Specifications for Miscellaneous Wastewater Treatment Systems

Dear Mr. McSwiggin:

ONE COPY SENT TO REGIONAL OFFICES 10-25-79 by TERRI S. SKH

We are submitting under separate cover, two sets of "as-built" plans and specifications for the miscellaneous wastewater treatment facilities constructed at the subject stations. These facilities were issued the following Illinois EPA construction permits:

ONE COPY MICROFILMED AS "AS BUILT" PLANS (54) AND SPECS (15).

Station		IEPA Permit No.	
Joliet	WILL COUNTY	1978-EB-1250	W1970450500A
Kincaid	CHRISTIAN	1977-EA-3150	W0210250500A
Powerton	TAZEWELL	1978-EA-427	W1794730500A
Ridgeland	COOK	1977-EB-3464	W0313000500A
Waukegan	LAKE	1977-EB-3699	W0971900500A
Will County	WILL	1977-EB-3463	W1978100500A

Each set of construction materials includes drawings of the site plan, piping and instrument diagrams, one-line electrical diagrams, process flow diagrams and equipment arrangement drawings. Also provided are installation and construction specifications for the structural and mechanical aspects of the projects. Finally, for your information, we have provided complete operation and maintenance manuals for each treatment facility. These documents explain the operating capabilities of all major equipment associated with each facility.

EMIS RETAINED BY DON RICHARDSON

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OCT 25 1979
ENVIRONMENTAL PROTECTION AGENCY
DIV. OF WATER POLLUTION CONTROL
RECORDS UNIT — SPRINGFIELD
STATE OF ILLINOIS

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If you should desire additional information or should have any questions, please call Jeffrey Smith of my staff at (312) 294-4457.

Very truly yours,

John H. Hughes
Director of Water Quality

JPS:JHH:ds

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Commonwealth Edison
72 West Adams Street, Chicago, Illinois
Address Reply to: Post Office Box 767
Chicago, Illinois 60690

May 16, 1977

RECEIVED
MAY 19 1977
ENVIRONMENTAL PROTECTION AGENCY
DIV. OF WATER POLLUTION CONTROL
RECORDS UNIT - SPRINGFIELD
STATE OF ILLINOIS

3699A-1

CERTIFIED MAIL

Mr. William H. Busch
Illinois Environmental
Protection Agency
Permit Section
2200 Churchill Road
Springfield, Illinois 62706

Attention: Mr. Larry M. Dupre

Subject: Additional Information in Support of Construction Permit Application for Wastewater Treatment Facilities at Waukegan Station

Dear Mr. Busch:

Attached are two schematic flow diagrams depicting: 1) the flow and mass balance of total dissolved solids and phosphorus through the wastewater treatment system, and 2) the relative locations of the discharges which will exist when the treatment system is operational. This information was requested by Mr. Larry Dupre for his review of the construction permit application.

If you should have any questions regarding this or any of the information previously submitted, please contact me or call Mr. Jeffrey Smith (312-294-2935) of my staff.

Sincerely,

John H. Hughes
Director of Water Quality

JHH:JPS:cg

Attachment

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Commonwealth Edison
72 West Adams Street, Chicago, Illinois
Address Reply to: Post Office Box 767
Chicago, Illinois 60690

March 21, 1977

CERTIFIED MAIL

RECEIVED
MAR 30 1977
ENVIRONMENTAL PROTECTION AGENCY
DIV. OF WATER POLLUTION CONTROL
RECORDS UNIT — SPRINGFIELD
STATE OF ILLINOIS

2699-77

Mr. William H. Busch
Illinois Environmental
Protection Agency
Permit Section
2200 Churchill Road
Springfield, Illinois 62706

Attention: Mr. Greg Delaney

Subject: Non-thermal Wastewater Treatment Facilities
Joint Construction and Operating Permit Application -
Waukegan Generating Station.

Dear Mr. Busch:

Attached for your review and approval are two copies of a permit application for the construction and operation of non-thermal wastewater treatment facilities planned for the Commonwealth Edison Company Waukegan Generating Station.

The application materials includes form WPC-PS-1, Schedules G, J and N, the Engineer's System Description Supplement, and supporting Engineering Drawings. A separate Schedule N has been completed for each of the three outfalls which will exist when the treatment facilities are operational.

If you should have any questions regarding this application please contact me or call Mr. Jeffrey Smith (312/294-2935), of my staff.

Sincerely,

C. L. McDonough

for John H. Hughes
Director of Water Quality

JHH:[illegible]bd
Att[illegible]ment

cc: U.[illegible] EPA - Compliance Section (w/o att.)

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Exhibit

34

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JUL 27 2022
IEPA/CAS

QUARTERLY GROUNDWATER MONITORING REPORT
WAUKEGAN GENERATING STATION

July 20, 2022

Groundwater Section
Illinois Environmental Protection Agency
Division of Public Water Supplies
MC#13
1021 North Grand Avenue East
Springfield, IL 62794-9276

IEPA
Division of Records Management
Releasable

AUG 09 2022

Reviewer: MDB

VIA FEDERAL EXPRESS

Re: Quarterly Groundwater Monitoring Results – Second Quarter 2022
Waukegan Generating Station – Ash Impoundments
Water Pollution Control Permit No. 2016-EB-61340

Dear Sir/Madam:

The second quarterly groundwater sampling for 2022 has been completed for the ash pond monitoring wells located at the Midwest Generation, LLC (Midwest Generation) Waukegan Generating Station in accordance with Water Pollution Control Permit No. 2016-EB-61340 (Permit) Special Condition Section #4 dated August 17, 2016. This quarterly monitoring report summarizes the results of the monitoring event.

Well Inspection and Sampling Procedures

The permit groundwater monitoring network around the ash ponds at this facility consists of seven wells (MW-01 through MW-07) as shown on Figure 1. As part of sampling procedures, the integrity of all monitoring wells was inspected and water levels were obtained using an electronic water level meter (see summary of water level discussion below). The wells were found in good condition with locked protector casings and the concrete surface seals were intact.

Groundwater samples at well locations MW-01 through MW-07 were collected using the low-flow sampling technique. The groundwater monitoring samples were analyzed for the inorganic compounds (unfiltered) listed in Illinois Administrative Code (IAC) 620.410(a) with the exception of perchlorate. Static water levels and field parameters, including pH, were also collected.

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Groundwater Flow Evaluation

Water level data from the most recent round of sampling along with historical water levels obtained from each well are summarized in Table 1. The water levels from the most recent sampling were used to generate a groundwater flow map which is provided on Figure 2. It is noted that concurrently measured water elevation data from other monitoring wells in the area that are not part of the standard permit monitoring well network were also used in development of the groundwater flow map. An evaluation of the flow map indicates a general east-southeasterly flow of groundwater in the vicinity of the ash ponds which is consistent with historical interpretations.

Summary of Analytical Data

A copy of the analytical data package is provided in Attachment 1. The field parameter and groundwater analytical data from the most recent sampling, along with the previous eight quarters of data, are summarized in Table 2. The duplicate sample was collected from well MW-03 and the relative percent difference for each detectable analyte was within an acceptable range (+/-30%) with the exception of sulfate which was detected in the investigative sample at 180 mg/L but was reported as not detected in the duplicate sample which had an elevated detection limit of 250 mg/L.

All wells for which the sampling data reports a value above one or more groundwater standards are located within the area of the approved Environmental Land Use Control (ELUC).

If there are any questions, please contact either Sharene Shealey of Midwest Generation at 724-255-3220 or Richard Gnat of KPRG at 262-781-0475.

Sincerely,

Paulo Rocha
Station Manager

Attachments

cc: Mike Summers/Lynn Dunaway, IEPA
Andrea Rhodes, IEPA
Mark Wehling, Midwest Generation
Sharene Shealey, Midwest Generation
Richard Gnat, KPRG and Associates, Inc.

FIGURES

ENVIRONMENTAL CONSULTATION & REMEDIATION

K P R G

KPRG and Associates, inc.

14665 West Lisbon Road, Suite 2B Brookfield, Wisconsin 53005 Telephone 262-781-0475 Facsimile 262-781-0478

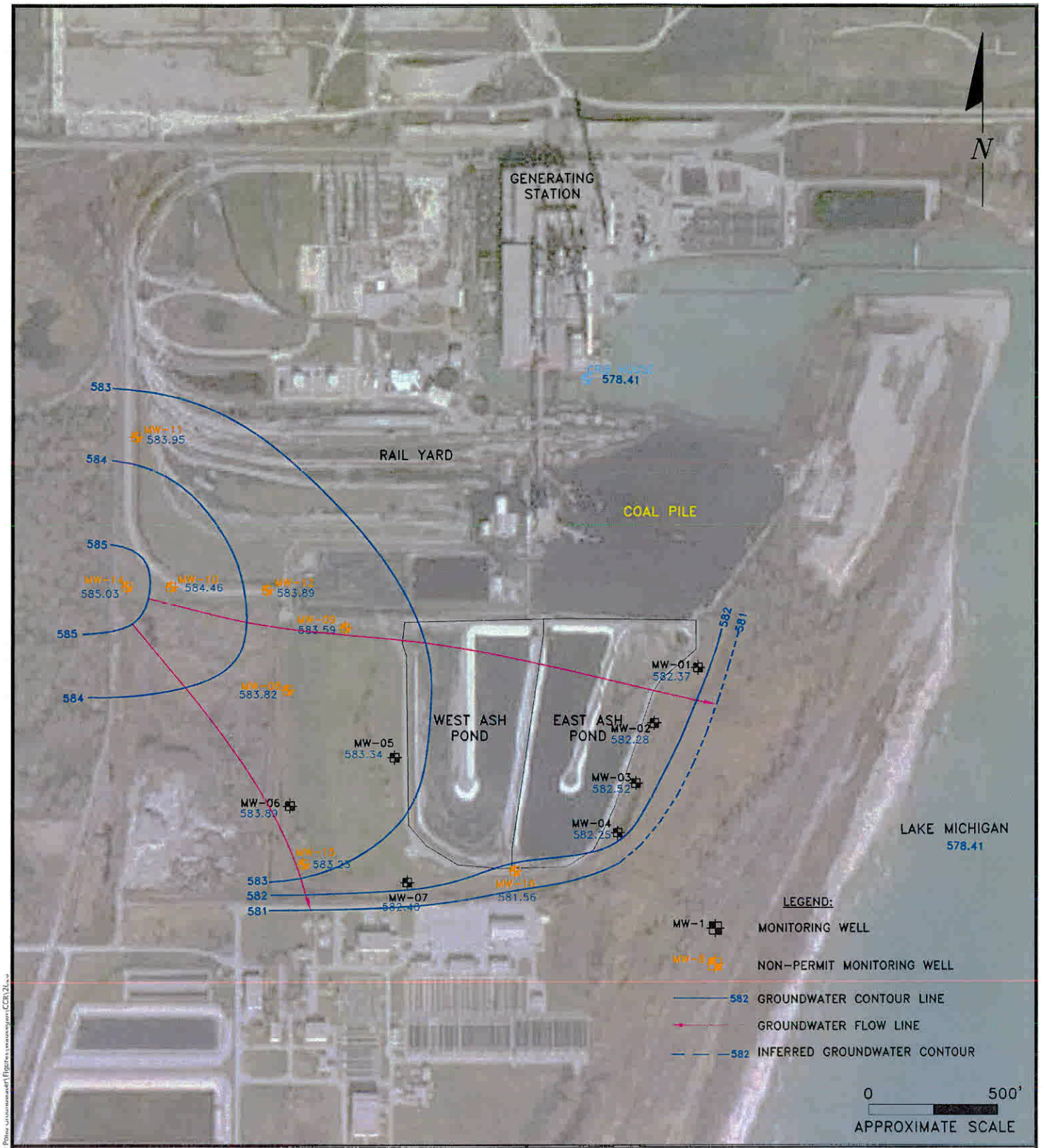
414 Plaza Drive, Suite 106 Westmont, Illinois 60559 Telephone 630-325-1300 Facsimile 630-325-1593

SITE MAP

WAUKEGAN STATION
WAUKEGAN, ILLINOIS

Scale: 1" = 500' | Date: January 23, 2015

KPRG Project No. 12313.2 | FIGURE 1



ENVIRONMENTAL CONSULTATION & REMEDIATION

K P R G

KPRG and Associates, inc.

14665 West Lisbon Road, Suite 1A Brookfield, Wisconsin 53005 Telephone 262-781-0475 Facsimile 262-781-0478

414 Plaza Drive, Suite 106 Westmont, Illinois 60559 Telephone 630-325-1300 Facsimile 630-325-1593

GROUNDWATER CONTOUR MAP 05/2022

WAUKEGAN STATION
WAUKEGAN, ILLINOIS

Scale: 1" = 500' | Date: July 18, 2022

KPRG Project No. 12313.2 | FIGURE 2

TABLES

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Table 1. Groundwater Elevations - Midwest Generation, LLC, Waukegan Station, Waukegan, IL

Well ID	Date	Top of Casing (TOC) Elevation (ft above MSL)	Ground Elevation (ft above MSL)	Groundwater Elevation (ft above MSL)	Sampling Groundwater Elevation (ft above MSL)	Bottom of Well Elevation (ft above MSL)	Depth to Groundwater (ft below TOC)	Sampling Depth to Groundwater (ft below TOC)	Depth to Bottom of Well (ft below TOC)
MW-01	11/6/2014	603.14	603.46	582.01	582.01	571.30	21.13	21.13	31.84
	2/17/2015	603.14	603.46	582.42	582.43	571.30	20.72	20.71	31.84
	4/21/2015	603.14	603.46	583.65	583.64	571.30	19.49	19.50	31.84
	8/12/2015	603.14	603.46	582.47	582.47	571.30	20.67	20.67	31.84
	11/2/2015	603.14	603.46	582.39	582.39	571.30	20.75	20.75	31.84
	2/29/2016	603.12	603.37	582.41	582.41	571.25	20.71	20.71	31.84
	5/2/2016	603.12	603.37	582.23	582.25	571.28	20.89	20.87	31.84
	8/23/2016	603.12	603.37	581.11	580.98	571.25	22.01	22.14	31.84
	12/2/2016	603.62	600.22	581.35	581.35	571.78	22.27	22.24	31.84
	2/21/2017	603.62	600.22	581.20	581.22	571.78	22.42	22.40	31.84
	5/15/2017	603.62	600.22	583.10	583.10	571.78	20.52	20.52	31.84
	9/14/2017	603.62	600.22	582.15	582.16	571.78	21.47	21.46	31.84
	11/27/2017	603.62	600.22	581.80	581.84	571.78	21.82	21.78	31.84
	2/7/2018	603.62	600.22	581.44	581.42	571.78	22.18	22.20	31.84
	5/29/2018	603.62	600.22	584.19	584.21	571.78	19.43	19.41	31.84
	8/20/2018	603.62	600.22	582.30	582.31	571.78	21.32	21.31	31.84
	11/5/2018	603.62	600.22	583.17	583.18	571.78	20.45	20.44	31.84
	2/11/2019	603.62	600.22	583.17	583.17	571.78	20.45	20.45	31.84
	5/14/2019	603.62	600.22	583.81	583.81	571.78	19.81	19.81	31.84
	8/13/2019	603.62	600.22	582.81	582.81	571.78	20.81	20.81	31.84
	11/18/2019	603.62	600.22	583.73	583.71	571.78	19.89	19.91	31.84
	3/2/2020	603.62	600.22	582.77	582.77	571.78	20.85	20.85	31.84
	4/21/2020	603.62	600.22	582.81	582.81	571.78	20.81	20.81	31.84
	8/17/2020	603.62	600.22	582.61	582.58	571.78	21.01	21.04	31.84
	11/17/2020	603.62	600.22	582.11	582.11	571.78	21.51	21.51	31.84
	3/1/2021	603.62	600.22	582.43	582.32	571.78	21.19	21.30	31.84
	5/5/2021	603.62	600.22	581.86	581.84	571.78	21.76	21.78	31.84
	8/18/2021	603.62	600.22	581.80	581.80	571.78	21.82	21.82	31.84
	11/3/2021	603.62	600.22	582.17	582.16	571.78	21.45	21.46	31.84
	2/8/2022	603.62	600.22	581.59	581.59	571.78	22.00	22.03	31.84
	5/23/2022	603.62	600.22	582.37	582.36	571.78	21.25	21.26	31.84
MW-02	11/6/2014	603.04	603.28	581.91	581.91	573.48	21.13	21.13	29.56
	2/17/2015	603.04	603.28	582.21	582.21	573.48	20.83	20.83	29.56
	4/21/2015	603.04	603.28	583.54	583.54	573.48	19.50	19.50	29.56
	8/12/2015	603.04	603.28	582.40	582.38	573.48	20.64	20.66	29.56
	11/2/2015	603.04	603.28	582.33	582.34	573.48	20.71	20.70	29.56
	2/29/2016	603.04	603.32	582.45	582.45	573.48	20.59	20.59	29.56
	5/2/2016	603.04	603.32	582.22	582.26	573.48	20.82	20.78	29.56
	8/23/2016	603.04	603.32	581.00	580.86	573.48	22.04	22.18	29.56
	12/2/2016	603.39	599.86	581.26	581.28	573.83	22.13	22.11	29.56
	2/21/2017	603.39	599.86	581.15	581.18	573.83	22.24	22.21	29.56
	5/15/2017	603.39	599.86	583.14	583.15	573.83	20.25	20.24	29.56
	9/14/2017	603.39	599.86	582.17	582.14	573.83	21.22	21.25	29.56
	11/27/2017	603.39	599.86	581.76	581.78	573.83	21.63	21.61	29.56
	2/7/2018	603.39	599.86	581.37	581.18	573.83	22.02	22.21	29.56
	5/29/2018	603.39	599.86	584.27	584.27	573.83	19.12	19.12	29.56
	8/20/2018	603.39	599.86	582.33	582.36	573.83	21.06	21.03	29.56
	11/5/2018	603.39	599.86	583.20	583.24	573.83	20.19	20.15	29.56
	2/11/2019	603.39	599.86	583.12	583.18	573.83	20.27	20.21	29.56
	5/14/2019	603.39	599.86	583.84	583.84	573.83	19.55	19.55	29.56
	8/13/2019	603.39	599.86	582.84	582.84	573.83	20.55	20.55	29.56
	11/18/2019	603.39	599.86	583.79	583.77	573.83	19.60	19.62	29.56
	3/2/2020	603.39	599.86	582.83	582.83	573.83	20.56	20.56	29.56
	4/21/2020	603.39	599.86	582.82	582.82	573.83	20.57	20.57	29.56
	8/17/2020	603.39	599.86	582.61	582.59	573.83	20.78	20.80	29.56
	11/17/2020	603.39	599.86	582.07	582.07	573.83	21.32	21.32	29.56
	3/1/2021	603.39	599.86	582.35	582.34	573.83	21.04	21.05	29.56
	5/5/2021	603.39	599.86	581.83	581.79	573.83	21.56	21.60	29.56
	8/18/2021	603.39	599.86	581.83	581.83	573.83	21.56	21.56	29.56
	11/3/2021	603.39	599.86	582.13	582.13	573.83	21.26	21.26	29.56
	2/8/2022	603.39	599.86	581.49	581.45	573.83	21.90	21.94	29.56
	5/23/2022	603.39	599.86	582.28	582.32	573.83	21.11	21.07	29.56
MW-03	11/6/2014	602.90	603.15	581.97	581.93	573.10	20.93	20.92	29.80
	2/17/2015	602.90	603.15	582.22	582.22	573.10	20.68	20.68	29.80
	4/21/2015	602.90	603.15	583.56	583.53	573.10	19.34	19.37	29.80
	8/12/2015	602.90	603.15	582.48	582.47	573.10	20.42	20.43	29.80
	11/2/2015	602.90	603.15	582.53	582.39	573.10	20.37	20.51	29.80
	2/29/2016	602.91	603.19	582.48	582.48	573.11	20.43	20.43	29.80
	5/2/2016	602.91	603.19	582.25	582.25	573.11	20.66	20.66	29.80
	8/23/2016	602.91	603.19	580.79	580.82	573.11	22.12	22.18	29.80
	12/2/2016	603.70	600.45	581.18	581.21	573.90	22.52	22.49	29.80
	2/21/2017	603.70	600.45	581.06	581.06	573.90	22.64	22.66	29.80
	5/15/2017	603.70	600.45	583.15	583.14	573.90	20.55	20.56	29.80
	9/14/2017	603.70	600.45	582.15	582.05	573.90	21.55	21.65	29.80
	11/28/2017	603.70	600.45	581.74	581.73	573.90	21.96	21.97	29.80
	2/8/2018	603.70	600.45	581.20	580.87	573.90	22.50	22.83	29.80
	5/29/2018	603.70	600.45	584.30	584.28	573.90	19.40	19.42	29.80
	8/20/2018	603.70	600.45	582.35	582.37	573.90	21.35	21.33	29.80
	11/5/2018	603.70	600.45	583.22	583.24	573.90	20.48	20.46	29.80
	2/11/2019	603.70	600.45	583.12	583.12	573.90	20.57	20.58	29.80
	5/14/2019	603.70	600.45	583.90	583.89	573.90	19.80	19.81	29.80
	8/13/2019	603.70	600.45	582.90	582.90	573.90	20.80	20.80	29.80
	11/18/2019	603.70	600.45	583.65	583.80	573.90	20.05	19.90	29.80
	3/2/2020	603.70	600.48	582.85	582.85	573.90	20.85	20.85	29.80
	4/21/2020	603.70	600.48	582.88	582.83	573.90	20.82	20.82	29.80
	8/17/2020	603.70	600.48	582.67	582.67	573.90	21.03	21.03	29.80
	11/17/2020	603.70	600.48	582.10	582.07	573.90	21.60	21.63	29.80
	3/1/2021	603.70	600.48	582.40	582.37	573.90	21.30	21.33	29.80
	5/5/2021	603.70	600.48	581.87	581.86	573.90	21.83	21.84	29.80
	8/18/2021	603.70	600.48	581.90	581.90	573.90	21.80	21.80	29.80
	11/3/2021	603.70	600.48	582.17	582.17	573.90	21.53	21.53	29.80
	2/8/2022	603.70	600.48	581.41	581.40	573.90	22.29	22.30	29.80
	5/23/2022	603.70	600.48	582.52	582.41	573.90	21.18	21.29	29.80
MW-04	11/6/2014	603.15	603.53	581.86	581.88	573.57	21.29	21.27	29.58
	2/17/2015	603.15	603.53	582.14	582.14	573.57	21.01	21.01	29.58
	4/21/2015	603.15	603.53	583.56	583.55	573.57	19.59	19.60	29.58
	8/12/2015	603.15	603.53	582.32	582.33	573.57	20.83	20.82	29.58
	11/2/2015	603.15	603.53	582.32	582.29	573.57	20.83	20.86	29.58
	2/29/2016	603.19	603.53	582.49	582.46	573.61	20.70	20.73	29.58
	5/2/2016	603.19	603.53	582.25	582.25	573.61	20.94	20.94	29.58
	8/23/2016	603.19	603.53	580.50	580.46	573.61	22.69	22.73	29.58
	12/2/2016	603.17	599.77	580.99	580.95	573.59	22.18	22.19	29.58
	2/21/2017	603.17	599.77	580.81	580.82	573.59	22.36	22.35	29.58
	5/15/2017	603.17	599.77	583.13	583.09	573.59	20.04	20.03	29.58
	9/14/2017	603.17	599.77	582.15	582.07	573.59	21.05	21.10	29.58
	11/28/2017	603.17	599.77	581.63	581.62	573.59	21.54	21.55	29.58
	2/8/2018	603.17	599.77	581.05	580.98	573.59	22.15	22.27	29.58
	5/30/2018	603.17	599.77	584.29	584.25	573.59	18.88	18.92	29.58
	8/20/2018	603.17	599.77	582.29	582.30	573.59	20.88	20.87	29.58
	11/6/2018	603.17	599.77	583.21	583.27	573.59	19.96	19.90	29.58
	2/11/2019	603.17	599.77	583.14	583.10	573.59	20.03	20.07	29.58
	5/14/2019	603.17	599.77	583.82	583.82	573.59	19.35	19.35	29.58
	8/13/2019	603.17	599.77	582.82	582.82	573.59	20.35	20.35	29.58
	11/18/2019	603.17	599.77	583.81	583.72	573.59	19.36	19.45	29.58
	3/2/2020	603.17	599.77	582.78	582.78	573.59	20.39	20.39	29.58
	4/21/2020	603.17	599.77	582.77	582.77	573.59	20.40	20.40	29.58
	8/17/2020	603.17	599.77	582.57	582.57	573.59	20.60	20.60	29.58
	11/17/2020	603.17	599.77	581.94	581.93	573.59	21.23	21.24	29.58
	3/1/2021	603.17	599.77	582.22	582.12	573.59	20.95	21.05	29.58
	5/5/2021	603.17	599.77	581.65	581.63	573.59	21.52	21.54	29.58
	8/18/2021	603.17	599.77	581.68	581.68	573.59	21.49	21.49	29.58
	11/3/2021	603.17	599.77	582.02	582.02	573.59	21.15	21.15	29.58
	2/8/2022	603.17	599.77	581.00	580.99	573.59	22.17	22.18	29.58
	5/23/2022	603.17	599.77	582.25	582.27	573.59	20.92	20.90	29.58

Electronic Filing: Received, Clerk's Office 10/31/2022

Table 1. Groundwater Elevations - Midwest Generation, LLC, Waukegan Station, Waukegan, IL

Well ID	Date	Top of Casing (TOC) Elevation (ft above MSL)	Ground Elevation (ft above MSL)	Groundwater Elevation (ft above MSL)	Sampling Groundwater Elevation (ft above MSL)	Bottom of Well Elevation (ft above MSL)	Depth to Groundwater (ft below TOC)	Sampling Depth to Groundwater (ft below TOC)	Depth to Bottom of Well (ft below TOC)
MW-05	11/5/2014	604.84	601.53	582.54	582.55	572.92	22.30	22.29	31.92
	2/17/2015	604.84	601.53	582.38	582.38	572.92	22.46	22.46	31.92
	4/20/2015	604.84	601.53	584.15	584.15	572.92	20.69	20.69	31.92
	8/13/2015	604.84	601.53	583.20	583.21	572.92	21.64	21.63	31.92
	11/2/2015	604.84	601.53	583.17	583.14	572.92	21.67	21.70	31.92
	2/29/2016	604.84	601.56	583.25	583.25	572.92	21.59	21.59	31.92
	5/2/2016	604.84	601.56	583.20	583.18	572.92	21.64	21.66	31.92
	8/23/2016	604.84	601.56	581.02	581.56	572.92	23.82	23.28	31.92
	12/2/2016	604.84	601.56	581.94	581.95	572.92	22.90	22.86	31.92
	2/21/2017	604.84	601.56	582.06	582.11	572.92	22.78	22.73	31.92
	5/15/2017	604.84	601.56	583.96	583.97	572.92	20.88	20.87	31.92
	9/11/2017	604.84	601.56	582.50	580.99	572.92	22.34	23.85	31.92
	11/30/2017	604.84	601.56	582.41	582.34	572.92	22.43	22.50	31.92
	2/7/2018	604.84	601.56	581.87	581.56	572.92	22.97	23.28	31.92
	5/31/2018	604.84	601.56	584.63	584.55	572.92	20.21	20.29	31.92
	8/20/2018	604.84	601.56	582.73	582.75	572.92	22.11	22.09	31.92
	11/7/2018	604.84	601.56	583.97	584.04	572.92	20.87	20.80	31.92
	2/11/2019	604.84	601.56	584.07	584.19	572.92	20.77	20.65	31.92
	5/14/2019	604.84	601.56	584.42	584.42	572.92	20.42	20.42	31.92
	8/13/2019	604.84	601.56	583.22	583.22	572.92	21.62	21.62	31.92
	11/18/2019	604.84	601.56	584.19	584.19	572.92	20.65	20.65	31.92
	3/2/2020	604.84	601.56	582.46	582.46	572.92	22.38	22.38	31.92
	4/21/2020	604.84	601.56	583.47	583.47	572.92	21.37	21.37	31.92
	8/17/2020	604.84	601.56	582.40	582.34	572.92	22.44	22.50	31.92
	11/17/2020	604.84	601.56	581.75	581.75	572.92	23.09	23.09	31.92
	3/1/2021	604.84	601.56	582.26	582.24	572.92	22.58	22.60	31.92
	5/5/2021	604.84	601.56	581.76	581.75	572.92	23.08	23.09	31.92
	8/18/2021	604.84	601.56	581.69	581.62	572.92	23.15	23.22	31.92
	11/3/2021	604.84	601.56	582.09	582.02	572.92	22.75	22.82	31.92
	2/9/2022	604.84	601.56	581.57	581.56	572.92	23.27	23.28	31.92
	5/23/2022	604.84	601.56	583.34	583.24	572.92	21.50	21.60	31.92
MW-06	11/5/2014	589.73	586.75	582.92	582.91	572.03	6.81	6.82	17.70
	2/18/2015	589.73	586.75	583.39	583.39	572.03	6.34	6.34	17.70
	4/20/2015	589.73	586.75	583.87	583.88	572.03	5.86	5.85	17.70
	8/12/2015	589.73	586.75	583.29	583.28	572.03	6.44	6.45	17.70
	11/2/2015	589.73	586.75	583.32	583.27	572.03	6.41	6.46	17.70
	2/29/2016	590.00	587.04	583.57	583.57	572.30	6.43	6.43	17.70
	5/2/2016	590.00	587.04	583.80	583.75	572.30	6.20	6.25	17.70
	8/23/2016	590.00	587.04	581.81	581.81	572.30	8.19	8.19	17.70
	12/2/2016	590.00	587.04	582.79	582.87	572.30	7.21	7.13	17.70
	2/21/2017	590.00	587.04	582.89	582.95	572.30	7.11	7.05	17.70
	5/15/2017	590.00	587.04	583.68	583.67	572.30	6.32	6.33	17.70
	9/11/2017	590.00	587.04	582.62	582.62	572.30	7.38	7.38	17.70
	11/28/2017	590.00	587.04	583.14	583.13	572.30	6.86	6.87	17.70
	2/8/2018	590.00	587.04	582.29	582.26	572.30	7.71	7.74	17.70
	5/30/2018	590.00	587.04	584.11	584.07	572.30	5.89	5.93	17.70
	8/21/2018	590.00	587.04	583.03	583.41	572.30	6.97	6.59	17.70
	11/7/2018	590.00	587.04	583.89	583.93	572.30	6.11	6.07	17.70
	2/11/2019	590.00	587.04	584.01	584.01	572.30	5.99	5.99	17.70
	5/14/2019	590.00	587.04	583.90	583.50	572.30	6.10	6.50	17.70
	8/13/2019	590.00	587.04	583.05	583.08	572.30	6.92	6.92	17.70
	11/18/2019	590.00	587.04	583.90	583.99	572.30	6.10	6.10	17.70
	3/2/2020	590.00	587.04	583.51	583.51	572.30	6.49	6.49	17.70
	4/21/2020	590.00	587.04	583.50	583.50	572.30	6.50	6.50	17.70
	8/17/2020	590.00	587.04	582.35	582.19	572.30	7.65	7.81	17.70
	11/17/2020	590.00	587.04	581.99	581.96	572.30	8.01	8.04	17.70
	3/1/2021	590.00	587.04	583.30	583.30	572.30	6.70	6.70	17.70
	5/5/2021	590.00	587.04	583.60	583.59	572.30	6.40	6.41	17.70
	8/18/2021	590.00	587.04	581.70	581.69	572.30	8.30	8.31	17.70
	11/3/2021	590.00	587.04	582.70	582.63	572.30	7.30	7.37	17.70
	2/9/2022	590.00	587.04	581.67	581.67	572.30	8.33	8.33	17.70
	5/23/2022	590.00	587.04	583.49	583.45	572.30	6.51	6.55	17.70
MW-07	11/5/2014	598.29	595.87	581.39	581.40	570.39	16.90	16.89	27.90
	2/17/2015	598.29	595.87	581.14	581.14	570.39	17.15	17.15	27.90
	4/20/2015	598.29	595.87	584.02	584.01	570.39	14.27	14.28	27.90
	8/12/2015	598.29	595.87	582.35	582.35	570.39	15.94	15.94	27.90
	11/2/2015	598.29	595.87	582.33	582.23	570.39	15.96	16.06	27.90
	2/29/2016	598.27	595.93	582.53	582.55	570.37	15.74	15.72	27.90
	5/2/2016	598.27	595.93	582.44	582.44	570.37	15.83	15.83	27.90
	8/23/2016	598.27	595.93	579.66	579.63	570.37	18.61	18.64	27.90
	12/2/2016	598.27	595.93	579.99	580.00	570.37	18.28	18.27	27.90
	2/21/2017	598.27	595.93	580.41	580.36	570.37	17.86	17.91	27.90
	5/15/2017	598.27	595.93	583.43	583.31	570.37	14.84	14.96	27.90
	9/11/2017	598.27	595.93	580.52	580.48	570.37	17.75	17.79	27.90
	11/28/2017	598.27	595.93	580.52	580.50	570.37	17.75	17.77	27.90
	2/6/2018	598.27	595.93	580.46	580.45	570.37	17.81	17.82	27.90
	5/30/2018	598.27	595.93	584.23	584.18	570.37	14.04	14.09	27.90
	8/21/2018	598.27	595.93	581.42	581.90	570.37	16.85	16.37	27.90
	11/7/2018	598.27	595.93	583.76	583.84	570.37	14.51	14.43	27.90
	2/11/2019	598.27	595.93	583.88	583.97	570.37	14.39	14.30	27.90
	5/14/2019	598.27	595.93	584.02	583.99	570.37	14.25	14.28	27.90
	8/13/2019	598.27	595.93	582.25	582.25	570.37	16.02	16.02	27.90
	11/18/2019	598.27	595.93	583.62	583.61	570.37	14.65	14.66	27.90
	3/2/2020	598.27	595.93	581.47	581.47	570.37	16.80	16.80	27.90
	4/21/2020	598.27	595.93	582.44	582.44	570.37	15.83	15.83	27.90
	8/17/2020	598.27	595.93	580.67	580.62	570.37	17.60	17.65	27.90
	11/17/2020	598.27	595.93	579.98	579.96	570.37	18.29	18.31	27.90
	3/1/2021	598.27	595.93	580.37	580.32	570.37	17.90	17.95	27.90
	5/5/2021	598.27	595.93	580.15	580.11	570.37	18.12	18.16	27.90
	8/18/2021	598.27	595.93	580.39	580.37	570.37	17.88	17.90	27.90
	11/3/2021	598.27	595.93	580.47	580.45	570.37	17.80	17.82	27.90
	2/8/2022	598.27	595.93	579.76	579.75	570.37	18.51	18.52	27.90
	5/23/2022	598.27	595.93	582.40	582.32	570.37	15.87	15.95	27.90

Note: Values for Depth to Bottom of Well are from prior to the installation of the dedicated pumps

Table 2. Groundwater Analytical Results - Midwest Generation LLC, Waukegan Station, Waukegan, IL

MW-01	Date	4/21/2020		8/17/2020		11/17/2020		3/1/2021		5/5/2021		8/18/2021		11/3/2021		2/8/2022		5/23/2022	
Parameter	Standards	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result
Antimony	0.006	0.003	ND	0.003	ND	0.003	ND	0.003	ND	0.003	ND	0.003	ND	0.003	0.0032	0.003	ND	0.003	ND
Arsenic	0.01	0.001	0.043	0.001	0.022	0.001	0.022	0.001	0.026	0.001	0.024	0.001	0.023	0.001	0.022	0.001	0.022	0.001	0.019
Barium	2	0.0025	0.041	0.0025	0.046	0.0025	0.068	0.0025	0.05	0.0025	0.04	0.0025	0.044	0.0025	0.039	0.0025	0.036	0.0025	0.052
Beryllium	0.004	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND ^+	0.001	ND	0.001	ND ^+
Boron	2	0.05	2.7	0.25	2.5	0.5	3.2	0.5	3.7	0.5	3.2	0.5	2.7	0.5	2.7	0.5	3.4	0.5	3
Cadmium	0.005	0.0005	ND	0.0005	ND	0.0005	ND	0.005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND
Chloride	200	2	25	2	48	10	92	10	110	6	70	10	65	6	59	4	43	4	35
Chromium	0.1	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND
Cobalt	1	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND
Copper	0.65	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND
Cyanide, Total	0.2	0.01	ND	0.005	ND	0.005	ND	0.005	0.0059	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	0.0081
Fluoride	4	0.1	0.22	0.1	0.27	0.1	0.15	0.1	0.16	0.1	0.2	0.1	0.18	0.1	0.23	0.1	0.23	0.1	0.21
Iron	5	0.1	ND	0.1	ND	0.1	ND	0.1	ND	0.1	ND	0.1	ND	0.1	ND	0.1	ND	0.1	ND
Lead	0.0075	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND
Manganese	0.15	0.0025	0.003	0.0025	0.011	0.0025	0.023	0.0025	0.0095	0.0025	0.0076	0.0025	0.016	0.0025	0.012	0.0025	0.0098	0.0025	0.021
Mercury	0.002	0.0002	ND	0.0002	ND	0.0002	ND	0.0002	ND	0.0002	ND	0.0002	ND	0.0002	ND	0.0002	ND	0.0002	ND
Nickel	0.1	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND
Nitrogen, Nitrate	10	0.1	0.17	0.1	ND	0.1	ND	0.1	ND	0.1	ND	0.1	ND	0.1	ND	0.1	ND	0.1	ND
Nitrogen, Nitrate Nitrite	NA	0.1	0.17	0.1	ND	0.1	ND	0.1	ND	0.1	ND	0.1	ND	0.1	ND	0.1	ND	0.1	ND
Nitrogen, Nitrite	NA	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND
Radium 226	20	0.0912	ND	0.0768	0.115	0.528	ND	0.102	ND	0.149	ND	0.221	ND	0.166	0.201	0.126	ND	0.201	ND
Radium 228	20	0.452	ND	0.393	ND	0.557	ND	0.565	ND	0.342	0.407	0.517	ND	0.474	0.572	0.4	0.452	0.425	ND
Selenium	0.05	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND
Silver	0.05	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND F1 F2	0.0005	ND	0.0005	ND
Sulfate	400	500	ND	25	210	25	240	25	210	25	190	50	170	50	180	25	220	50	200
Thallium	0.002	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND
Total Dissolved Solids	1,200	10	450	30	470	30	650	10	560	10	460	10	440	10	360	10	460	10	470
Vanadium	0.049	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND
Zinc	5	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND
pH	6.5 - 9.0	NA	9.40	NA	8.48	NA	7.97	NA	8.92	NA	9.00	NA	8.31	NA	8.56	NA	8.67	NA	7.77
Temperature	NA	NA	12.50	NA	13.40	NA	13.60	NA	13.40	NA	13.50	NA	14.80	NA	14.20	NA	13.40	NA	13.50
Conductivity	NA	NA	0.633	NA	0.738	NA	1.090	NA	1.151	NA	0.706	NA	0.688	NA	0.712	NA	0.728	NA	0.846
Dissolved Oxygen	NA	NA	0.46	NA	0.37	NA	1.78	NA	-1.85	NA	1.40	NA	0.46	NA	0.23	NA	0.80	NA	0.44
ORP	NA	NA	25.0	NA	75.6	NA	6.3	NA	56.6	NA	69.1	NA	155.1	NA	163.3	NA	226.1	NA	186.0

Notes: Standards obtained from IAC, Title 35, Chapter I, Part 620, Subpart D, Section 620.410 - Groundwater Quality Standards for Class I: Potable Resource Groundwater
All values are in mg/L (ppm) unless otherwise noted.

DL - Detection limit
* - LCS or LCSD is outside acceptable limits.
NA - Not Applicable
ND - Not Detected

Temperature	°C	degrees Celsius
Conductivity	ms/cm	millisiemens/centimeters
Dissolved Oxygen	mg/L	milligrams/liter
Oxygen Reduction Potential (ORP)	mV	millivolts

D- Compound also detected in blank
^ - Instrument related QC outside limits.
DNYA - Data Not Yet Available

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Table 2. Groundwater Analytical Results - Midwest Generation LLC, Waukegan Station, Waukegan, IL

MW-02	Date	4/21/2020		8/17/2020		11/17/2020		3/1/2021		5/5/2021		8/18/2021		11/3/2021		2/8/2022		5/23/2022	
Parameter	Standards	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result
Antimony	0.006	0.003	ND	0.003	ND	0.003	ND	0.003	ND	0.003	ND	0.003	ND	0.003	ND	0.003	ND	0.003	ND
Arsenic	0.01	0.001	0.008	0.001	0.0087	0.001	0.0066	0.001	0.013	0.001	0.0083	0.001	0.01	0.001	0.0098	0.001	0.013	0.001	0.01
Barium	2	0.0025	0.032	0.0025	0.021	0.0025	0.028	0.0025	0.032	0.0025	0.03	0.0025	0.027	0.0025	0.024	0.0025	0.03	0.0025	0.031
Beryllium	0.004	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND ^+	0.001	ND	0.001	ND ^+
Boron	2	0.05	3.3	0.25	2.8	0.5	3.8	0.5	4.6	1	4.6	0.5	4.1	0.5	4.2	1	4.6	0.5	3.5
Cadmium	0.005	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND
Chloride	200	2	50	2	50	2	23	2	34	2	38	2	40	6	44	2	33	4	30
Chromium	0.1	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND
Cobalt	1	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND
Copper	0.65	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND
Cyanide, Total	0.2	0.01	ND	0.005	ND	0.005	ND	0.005	0.0054	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND
Fluoride	4	0.1	1	0.1	0.94	0.1	0.78	0.1	0.84	0.1	0.72	0.1	0.51	0.1	0.66	0.1	0.43	0.1	0.47
Iron	5	0.1	ND	0.1	0.19	0.1	ND	0.1	0.36	0.1	ND	0.1	0.14	0.1	ND	0.1	0.25	0.1	0.21
Lead	0.0075	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND
Manganese	0.15	0.0025	0.037	0.0025	0.034	0.0025	0.048	0.0025	0.042	0.0025	0.042	0.0025	0.05	0.0025	0.053	0.0025	0.055	0.0025	0.087
Mercury	0.002	0.0002	ND	0.0002	ND	0.0002	ND	0.0002	ND	0.0002	ND	0.0002	ND	0.0002	ND	0.0002	ND	0.0002	ND
Nickel	0.1	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND
Nitrogen, Nitrate	10	0.1	0.1	0.1	0.2	0.1	ND	0.1	ND	0.1	ND	0.1	ND	0.1	ND	0.1	ND	0.1	ND
Nitrogen, Nitrate Nitrite	NA	0.1	0.1	0.1	0.2	0.1	ND	0.1	ND	0.1	ND	0.1	ND	0.1	ND	0.1	ND	0.1	ND
Nitrogen, Nitrite	NA	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND
Radium 226	20	0.105	ND	0.0806	ND	0.54	ND	0.0997	ND	0.15	ND	0.205	ND	0.161	0.265	0.151	ND	0.208	ND
Radium 228	20	0.424	ND	0.372	ND	0.532	ND	0.586	0.586	0.463	ND	0.501	ND	0.386	ND	0.48	0.565	0.47	ND
Selenium	0.05	0.0025	0.0028	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	0.005
Silver	0.05	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND
Sulfate	400	500	ND	25	230	100	300	25	190	25	200	50	190	50	170	25	200	50	190
Thallium	0.002	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND
Total Dissolved Solids	1,200	10	600	30	550	30	610	10	450	10	410	10	490	10	370	10	500	10	480
Vanadium	0.049	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND
Zinc	5	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND
pH	6.5 - 9.0	NA	8.02	NA	7.89	NA	7.67	NA	8.54	NA	8.39	NA	7.92	NA	7.78	NA	8.00	NA	8.12
Temperature	NA	NA	12.10	NA	13.60	NA	13.10	NA	12.10	NA	12.50	NA	14.40	NA	13.50	NA	12.40	NA	13.00
Conductivity	NA	NA	0.305	NA	0.830	NA	0.990	NA	0.861	NA	0.690	NA	0.723	NA	0.643	NA	0.699	NA	0.658
Dissolved Oxygen	NA	NA	0.31	NA	1.72	NA	2.25	NA	-0.04	NA	1.10	NA	0.20	NA	0.31	NA	0.60	NA	0.51
ORP	NA	NA	-87.6	NA	-0.6	NA	-45.7	NA	-80.3	NA	11.9	NA	110.2	NA	150.2	NA	174.9	NA	155.8

Notes: Standards obtained from IAC, Title 35, Chapter I, Part 620, Subpart D, Section 620.410 - Groundwater Quality Standards for Class I: Potable Resource Groundwater
All values are in mg/L (ppm) unless otherwise noted.

DL - Detection limit
* - LCS or LCSD is outside acceptable limits.
NA - Not Applicable
ND - Not Detected

Temperature	°C	degrees Celsius
Conductivity	ms/cm	millisiemens/centimeters
Dissolved Oxygen	mg/L	milligrams/liter
Oxygen Reduction Potential (ORP)	mV	millivolts

B- Compound also detected in blank
^ - Instrument related QC outside limits.
DNYA - Data Not Yet Available

Electronic Filing: Received, Clerk's Office 10/31/2022

Table 2. Groundwater Analytical Results - Midwest Generation LLC, Waukegan Station, Waukegan, IL

MW-03	Date	4/21/2020		8/17/2020		11/17/2020		3/1/2021		5/5/2021		8/18/2021		11/3/2021		2/8/2022		5/23/2022	
Parameter	Standards	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result
Antimony	0.006	0.003	ND	0.003	ND	0.003	ND	0.003	ND	0.003	ND	0.003	ND	0.003	ND	0.003	ND	0.003	ND
Arsenic	0.01	0.001	0.0066	0.001	0.0041	0.001	0.0071	0.001	0.0073	0.001	0.007	0.001	0.0055	0.001	0.0068	0.001	0.0086	0.001	0.01
Barium	2	0.0025	0.033	0.0025	0.046	0.0025	0.033	0.0025	0.042	0.0025	0.038	0.0025	0.044	0.0025	0.034	0.0025	0.032	0.0025	0.021
Beryllium	0.004	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND ^+	0.001	ND	0.001	ND ^+
Boron	2	1	4.3	0.25	2.9	0.5	3.7	0.5	4.8	0.5	5.8	0.5	3.2	0.5	3.1	0.25	2.8	0.5	2.4
Cadmium	0.005	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND
Chloride	200	2	17	2	45	2	54	2	45	2	45	2	45	6	40	2	30	4	32
Chromium	0.1	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND
Cobalt	1	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND
Copper	0.65	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND
Cyanide, Total	0.2	0.01	ND	0.005	ND	0.005	ND	0.005	0.0057	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	0.0057
Fluoride	4	0.1	0.28	0.1	0.22	0.1	0.26	0.1	0.2	0.1	0.21	0.1	0.17	0.1	0.2	0.1	0.21	0.1	0.22
Iron	5	0.1	ND	0.1	ND	0.1	ND	0.1	ND	0.1	ND	0.1	ND	0.1	ND	0.1	ND	0.1	ND
Lead	0.0075	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND
Manganese	0.15	0.0025	0.065	0.0025	0.1	0.0025	0.072	0.0025	0.09	0.0025	0.096	0.0025	0.11	0.0025	0.071	0.0025	0.045	0.0025	0.032
Mercury	0.002	0.0002	ND	0.0002	ND	0.0002	ND	0.0002	ND	0.0002	ND	0.0002	0.00022	0.0002	ND	0.0002	ND	0.0002	ND
Nickel	0.1	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND
Nitrogen, Nitrate	10	0.1	0.51	0.1	0.31	0.1	0.14	0.1	0.3	0.1	0.19	0.1	0.14	0.1	ND	0.1	ND	0.1	ND
Nitrogen, Nitrate Nitrite	NA	0.1	0.51	0.1	0.31	0.1	0.14	0.1	0.3	0.1	0.19	0.1	0.14	0.1	ND	0.1	ND	0.1	ND
Nitrogen, Nitrite	NA	0.02	ND ^	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	0.02	0.02	ND	0.02	ND	0.02	ND
Radium 226	20	0.114	0.166	0.0848	0.228	0.531	ND	0.11	ND	0.131	0.201	0.187	ND	0.206	ND	0.152	0.161	0.161	ND
Radium 228	20	0.462	ND	0.355	0.426	0.484	0.51	0.717	ND	0.381	0.503	0.467	0.745	0.505	0.576	0.39	ND	0.493	ND
Selenium	0.05	0.0025	0.013	0.0025	0.011	0.0025	0.0033	0.0025	0.01	0.0025	0.0078	0.0025	0.011	0.0025	0.0096	0.0025	0.0071	0.0025	0.0061
Silver	0.05	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND
Sulfate	400	500	ND	100	290	50	250	100	290	25	220	50	280	50	240	25	210	50	180
Thallium	0.002	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND
Total Dissolved Solids	1,200	10	720	30	870	30	640	10	700	10	560	10	780	10	610	10	560	10	470
Vanadium	0.049	0.005	0.012	0.005	0.0077	0.005	0.0051	0.005	0.0076	0.005	0.0058	0.005	0.0053	0.005	ND	0.005	0.0081	0.005	ND
Zinc	5	0.02	ND	0.02	0.11	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND
pH	6.5 - 9.0	NA	6.87	NA	6.9	NA	7.05	NA	7.19	NA	7.18	NA	6.9	NA	7.05	NA	7.16	NA	8.72
Temperature	NA	NA	13	NA	12.5	NA	13.7	NA	14.2	NA	13.8	NA	13.8	NA	14.3	NA	15.5	NA	14.4
Conductivity	NA	NA	0.85	NA	1.314	NA	1.09	NA	1.496	NA	0.967	NA	1.153	NA	0.959	NA	0.869	NA	0.636
Dissolved Oxygen	NA	NA	0.32	NA	0.28	NA	2.21	NA	0.59	NA	0.56	NA	0.47	NA	0.39	NA	0.54	NA	0.61
ORP	NA	NA	20.1	NA	88.5	NA	19.6	NA	86.3	NA	134.2	NA	173.7	NA	154.3	NA	190.2	NA	152

Notes: Standards obtained from IAC, Title 35, Chapter I, Part 620, Subpart D, Section 620.410 - Groundwater Quality Standards for Class I: Potable Resource Groundwater
All values are in mg/L (ppm) unless otherwise noted.

'DL - Detection limit
* - LCS or LCSD is outside acceptable limits.
NA - Not Applicable
ND - Not Detected

Temperature	°C	degrees Celsius
Conductivity	ms/cm	millisiemens/centimeters
Dissolved Oxygen	mg/L	milligrams/liter
Oxygen Reduction Potential (ORP)	mV	millivolts

B- Compound also detected in blank
^ - Instrument related QC outside limits.
DNYA - Data Not Yet Available

Electronic Filing: Received, Clerk's Office 10/31/2022

Table 2. Groundwater Analytical Results - Midwest Generation LLC, Waukegan Station, Waukegan, IL

MW-04	Date	4/21/2020		8/17/2020		11/18/2020		3/1/2020		5/5/2021		8/18/2021		11/3/2021		2/8/2022		5/23/2022	
Parameter	Standards	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result
Antimony	0.006	0.003	ND	0.003	ND	0.003	ND	0.003	ND	0.003	ND	0.003	ND	0.003	ND	0.003	ND	0.003	ND
Arsenic	0.01	0.001	0.0051	0.001	0.004	0.001	0.0054	0.001	0.016	0.001	0.0089	0.001	0.0064	0.001	0.0073	0.001	0.013	0.001	0.0063
Barium	2	0.0025	0.043	0.0025	0.039	0.0025	0.042	0.0025	0.036	0.0025	0.032	0.0025	0.04	0.0025	0.037	0.0025	0.055	0.0025	0.041
Beryllium	0.004	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND ^+	0.001	ND	0.001	ND ^+
Boron	2	0.05	2.7	0.5	3.7	0.5	3.2	0.5	3.3	0.5	3.2	0.5	3	0.5	2.7	0.5	3.3	0.5	2.5
Cadmium	0.005	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND
Chloride	200	2	34	2	21	2	19	2	17	2	17	2	41	6	50	2	36	4	41
Chromium	0.1	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND
Cobalt	1	0.001	ND	0.001	ND	0.001	ND	0.001	0.0013	0.001	0.0011	0.001	ND	0.001	ND	0.001	ND	0.001	ND
Copper	0.65	0.002	ND	0.002	0.0043	0.002	ND	0.002	ND	0.002	ND	0.002	0.0022	0.002	ND	0.002	ND	0.002	ND
Cyanide, Total	0.2	0.01	ND	0.005	ND	0.005	ND	0.005	0.0055	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	0.0088
Fluoride	4	0.1	0.91	0.1	1.1	0.1	0.99	0.1	0.89	0.1	0.92	0.1	0.85	0.1	0.99	0.1	0.58	0.1	0.57
Iron	5	0.1	ND	0.1	ND	0.1	ND	0.1	0.42	0.1	0.2	0.1	0.17	0.1	ND	0.1	0.42	0.1	0.11
Lead	0.0075	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND
Manganese	0.15	0.0025	0.13	0.0025	0.1	0.0025	0.16	0.0025	0.2	0.0025	0.18	0.0025	0.15	0.0025	0.12	0.0025	0.14	0.0025	0.097
Mercury	0.002	0.0002	ND	0.0002	ND	0.0002	ND FI	0.0002	ND	0.0002	ND	0.0002	ND	0.0002	ND	0.0002	ND	0.0002	ND
Nickel	0.1	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND
Nitrogen, Nitrate	10	0.1	0.14	0.1	0.3	0.1	0.15	0.1	0.14	0.1	0.23	0.1	ND	0.1	ND	0.1	ND	0.1	ND
Nitrogen, Nitrate Nitrite	NA	0.1	0.14	0.1	0.3	0.1	0.15	0.1	0.14	0.1	0.23	0.1	ND	0.1	ND	0.1	ND	0.1	ND
Nitrogen, Nitrite	NA	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND
Radium 226	20	0.136	0.217	0.0815	0.114	0.469	ND	0.122	0.19	0.147	ND	0.223	ND	0.21	ND	0.13	0.176	0.209	ND
Radium 228	20	0.572	ND	0.32	ND	0.631	0.631	0.51	ND	0.401	ND	0.476	0.582	0.424	ND	0.358	0.577	0.39	ND
Selenium	0.05	0.0025	0.0034	0.0025	0.0061	0.0025	0.0027	0.0025	ND	0.0025	0.0042	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND
Silver	0.05	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND
Sulfate	400	500	ND	100	290	50	250	25	230	25	190	50	210	50	150	25	180	50	160
Thallium	0.002	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND
Total Dissolved Solids	1,200	10	700	30	710	30	680	10	590	10	510	10	570	10	510	10	660	10	500
Vanadium	0.049	0.005	ND	0.005	0.0055	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND
Zinc	5	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND
pH	6.5 - 9.0	NA	7.18	NA	7.06	NA	7.17	NA	7.66	NA	7.46	NA	7.45	NA	7.36	NA	7.61	NA	8.05
Temperature	NA	NA	11.90	NA	13.20	NA	13.70	NA	11.50	NA	10.70	NA	13.00	NA	13.10	NA	12.00	NA	11.20
Conductivity	NA	NA	0.297	NA	1.131	NA	1.120	NA	1.100	NA	0.792	NA	0.838	NA	0.702	NA	0.917	NA	0.596
Dissolved Oxygen	NA	NA	0.30	NA	2.02	NA	2.34	NA	0.54	NA	0.20	NA	0.15	NA	0.27	NA	0.28	NA	0.47
ORP	NA	NA	-28.5	NA	54.3	NA	-15.8	NA	-45.6	NA	81.8	NA	58.9	NA	127.1	NA	154.5	NA	143.1

Notes: Standards obtained from IAC, Title 35, Chapter I, Part 620, Subpart D, Section 620.410 - Groundwater Quality Standards for Class I: Potable Resource Groundwater
All values are in mg/L (ppm) unless otherwise noted.

DL - Detection limit
* - LCS or LCSD is outside acceptable limits.
NA - Not Applicable
ND - Not Detected

Temperature	°C	degrees Celsius
Conductivity	ms/cm	millisiemens/centimeters
Dissolved Oxygen	mg/L	milligrams/liter
Oxygen Reduction Potential (ORP)	mV	millivolts

B- Compound also detected in blank
^ - Instrument related QC outside limits.
DNYA - Data Not Yet Available

Electronic Filing: Received, Clerk's Office 10/31/2022

Table 2. Groundwater Analytical Results - Midwest Generation LLC, Waukegan Station, Waukegan, IL

MW-05	Date	4/22/2020		8/17/2020		11/19/2020		3/1/2021		5/7/2021		8/20/2021		11/5/2021		2/9/2022		5/24/2022	
Parameter	Standards	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result
Antimony	0.006	0.003	ND	0.003	ND	0.003	ND	0.003	ND	0.003	ND	0.003	ND	0.003	ND	0.003	ND	0.003	ND
Arsenic	0.01	0.001	0.0028	0.001	0.017	0.001	0.034	0.001	0.04	0.001	0.021	0.001	0.017	0.001	0.039	0.001	0.045	0.001	0.0071
Barium	2	0.0025	0.031	0.0025	0.04	0.0025	0.06	0.0025	0.054	0.0025	0.049	0.0025	0.042	0.0025	0.041	0.0025	0.038	0.0025	0.031
Beryllium	0.004	0.001	ND ^	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND ^+	0.001	ND	0.001	ND ^+
Boron	2	1	5.4	5	31	5	29	5	33	5	33	5	29	5	25	5	24	1	8.7
Cadmium	0.005	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND
Chloride	200	2	12	2	21	2	32	2	31	2	20	2	21	2	24	2	20	2	9.9
Chromium	0.1	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND
Cobalt	1	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND
Copper	0.65	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND
Cyanide, Total	0.2	0.01	ND	0.005	ND	0.005	ND	0.005	0.0065	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND
Fluoride	4	0.1	0.18	0.1	0.25	0.1	0.28	0.1	0.29	0.1	0.28	0.1	0.26	0.1	0.27	0.1	0.25	0.1	0.16
Iron	5	0.1	0.87	0.1	17	0.1	19	0.1	14	0.1	12	0.1	11	0.1	12	0.1	12	0.1	1.8
Lead	0.0075	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND
Manganese	0.15	0.0025	0.083	0.0025	0.65	0.0025	0.64	0.0025	0.54	0.0025	0.65	0.0025	0.59	0.0025	0.54	0.0025	0.55	0.0025	0.28
Mercury	0.002	0.0002	ND	0.0002	ND	0.0002	ND	0.0002	ND	0.0002	ND	0.0002	ND	0.0002	ND	0.0002	ND	0.0002	ND
Nickel	0.1	0.002	0.003	0.002	0.0023	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	0.0034
Nitrogen, Nitrate	10	0.1	ND	0.1	ND	0.1	ND	0.1	ND	0.1	ND	0.1	ND	0.1	ND	0.1	ND	0.1	ND
Nitrogen, Nitrate Nitrite	NA	0.1	ND	0.1	ND	0.1	ND	0.1	ND	0.1	ND	0.1	ND	0.1	ND	0.1	ND	0.1	ND
Nitrogen, Nitrite	NA	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND
Radium 226	20	0.108	ND	0.109	0.137	0.362	0.431	0.102	0.337	0.235	ND	0.167	0.418	0.127	0.25	0.123	0.298	0.167	0.186
Radium 228	20	0.536	ND	0.414	ND	0.459	0.739	0.63	1.31	0.602	1.32	0.408	0.996	0.385	1.52	0.379	0.927	0.727	0.875
Selenium	0.05	0.0025	0.0046	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	0.0071
Silver	0.05	0.0005	ND ^	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND
Sulfate	400	1000	ND	100	930	100	930	100	880	100	850	100	800	100	700	100	670	250	990
Thallium	0.002	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND
Total Dissolved Solids	1,200	10	1900	150	2000	150	2100	10	1800	10	1700	10	1100	10	1600	10	1300	10	2400
Vanadium	0.049	0.005	ND	0.005	0.0072	0.005	0.0051	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND
Zinc	5	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	0.02	0.02	ND	0.02	ND	0 02	ND
pH	6.5 - 9.0	NA	6.63	NA	6.58	NA	6.94	NA	7.02	NA	7.00	NA	6.99	NA	6.90	NA	7.08	NA	6.61
Temperature	NA	NA	11.90	NA	12.80	NA	12.70	NA	11.70	NA	12.00	NA	13.40	NA	12.70	NA	11.80	NA	12.10
Conductivity	NA	NA	0.370	NA	2.401	NA	2.446	NA	2.744	NA	1.996	NA	1.924	NA	1.921	NA	1.749	NA	2.806
Dissolved Oxygen	NA	NA	0.30	NA	6.00	NA	1.90	NA	0.32	NA	0.13	NA	0.14	NA	0.15	NA	0.23	NA	0.56
ORP	NA	NA	-11.3	NA	151.0	NA	-110.5	NA	-97.2	NA	-100.6	NA	-87.0	NA	-91.3	NA	24.6	NA	162.5

Notes: Standards obtained from IAC, Title 35, Chapter I, Part 620, Subpart D, Section 620.410 - Groundwater Quality Standards for Class I: Potable Resource Groundwater
All values are in mg/L (ppm) unless otherwise noted.

DL - Detection limit
* - LCS or LCSD is outside acceptable limits.
NA - Not Applicable
ND - Not Detected

Temperature	°C	degrees Celsius
Conductivity	ms/cm	millisiemens/centimeters
Dissolved Oxygen	mg/L	milligrams/liter
Oxygen Reduction Potential (ORP)	mV	millivolts

B- Compound also detected in blank
^ - Instrument related QC outside limits.
DNYA - Data Not Yet Available

Electronic Filing: Received, Clerk's Office 10/31/2022

Table 2. Groundwater Analytical Results - Midwest Generation LLC, Waukegan Station, Waukegan, IL

MW-06	Date	4/22/2020		8/18/2020		11/19/2020		3/2/2021		5/7/2021		8/20/2021		11/5/2021		2/9/2022		5/24/2022	
Parameter	Standards	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result
Antimony	0.006	0.003	ND	0.003	ND	0.003	ND	0.003	ND	0.003	ND	0.003	ND	0.003	ND	0.003	ND	0.003	ND
Arsenic	0.01	0.001	0.0015	0.001	0.0028	0.001	0.0026	0.001	0.0028	0.001	0.0018	0.001	0.0021	0.001	0.0033	0.001	0.004	0.001	0.0013
Barium	2	0.0025	0.12	0.0025	0.12	0.0025	0.11	0.0025	0.082	0.0025	0.07	0.0025	0.061	0.0025	0.065	0.0025	0.077	0.0025	0.082
Beryllium	0.004	0.001	ND ^	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND ^+	0.001	ND	0.001	ND ^+
Boron	2	0.25	2	0.25	1.2	0.5	2.1	2.5	4	0.25	1.6	0.25	0.91	1	24	0.25	0.68	0.5	3.1
Cadmium	0.005	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND
Chloride	200	10	140	10	100	2	64	2	49	10	56	10	52	6	42	2	39	4	37
Chromium	0.1	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND
Cobalt	1	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND
Copper	0.65	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND
Cyanide, Total	0.2	0.01	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	0.005	0.005	ND
Fluoride	4	0.1	0.36	0.1	0.4	0.1	0.37	0.1	0.33	0.1	0.34	0.1	0.38	0.1	0.38	0.1	0.29	0.1	0.3
Iron	5	0.1	3.8	0.1	6	0.1	8.3	0.1	4.9	0.1	3.4	0.1	2.4	0.1	4	0.1	9.6	0.1	3.6
Lead	0.0075	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND
Manganese	0.15	0.0025	0.17	0.0025	0.14	0.0025	0.36	0.0025	0.19	0.0025	0.2	0.0025	0.13	0.0025	0.34	0.0025	0.18	0.0025	0.25
Mercury	0.002	0.0002	ND	0.0002	ND	0.0002	ND	0.0002	ND	0.0002	ND	0.0002	ND	0.0002	ND	0.0002	ND	0.0002	ND
Nickel	0.1	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND
Nitrogen, Nitrate	10	0.1	ND	0.1	ND	0.1	ND	0.1	ND	0.1	ND	0.1	ND	0.1	ND	0.1	ND	0.1	ND
Nitrogen, Nitrate Nitrite	NA	0.1	ND	0.1	ND	0.1	ND	0.1	ND	0.1	ND	0.1	ND	0.1	ND	0.1	ND	0.1	ND
Nitrogen, Nitrite	NA	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND
Radium 226	20	0.116	0.272	0.145	0.374	ND	0.478	0.1	0.312	0.132	0.217	0.195	ND	0.168	0.466	0.143	ND	0.15	ND
Radium 228	20	0.698	1.1	0.534	1.48	ND	0.606	0.47	ND *	0.46	0.552	0.481	ND	0.518	ND	0.427	ND	0.576	ND
Selenium	0.05	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	0.03	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND
Silver	0.05	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND
Sulfate	400	130	ND	25	58	50	350	25	190	25	99	5	17	15	89	10	57	25	110
Thallium	0.002	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND
Total Dissolved Solids	1,200	10	880	30	590	60	1300	10	660	10	530	10	350	10	560	10	440	10	580
Vanadium	0.049	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	0.0059	0.005	0.0072	0.005	ND
Zinc	5	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND
pH	6.5 - 9.0	NA	7.11	NA	6.98	NA	6.86	NA	7.16	NA	7.21	NA	7.20	NA	7.19	NA	7.35	NA	7.22
Temperature	NA	NA	7.90	NA	13.00	NA	12.30	NA	7.30	NA	8.40	NA	13.30	NA	11.60	NA	8.40	NA	8.10
Conductivity	NA	NA	0.327	NA	1.243	NA	1.866	NA	1.269	NA	1.010	NA	0.826	NA	0.955	NA	0.791	NA	0.968
Dissolved Oxygen	NA	NA	0.21	NA	0.12	NA	2.07	NA	0.44	NA	2.07	NA	0.18	NA	0.12	NA	0.35	NA	0.51
ORP	NA	NA	-118.5	NA	-117.2	NA	-89.6	NA	-53.9	NA	-66.4	NA	-55.6	NA	-60.3	NA	5.4	NA	39.4

Notes: Standards obtained from IAC, Title 35, Chapter I, Part 620, Subpart D, Section 620.410 - Groundwater Quality Standards for Class I: Potable Resource Groundwater
All values are in mg/L (ppm) unless otherwise noted.

DL - Detection limit
* - LCS or LCSD is outside acceptable limits.
NA - Not Applicable
ND - Not Detected

Temperature	°C	degrees Celsius
Conductivity	ms/cm	millisiemens/centimeters
Dissolved Oxygen	mg/L	milligrams/liter
Oxygen Reduction Potential (ORP)	mV	millivolts

B- Compound also detected in blank
^ - Instrument related QC outside limits.
DNYA - Data Not Yet Available

Electronic Filing: Received, Clerk's Office 10/31/2022

Table 2. Groundwater Analytical Results - Midwest Generation LLC, Waukegan Station, Waukegan, IL

MW-07	Date	4/22/2020		8/18/2020		11/19/2020		3/1/2021		5/7/2021		8/20/2021		11/5/2021		2/9/2022		5/24/2022	
Parameter	Standards	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result
Antimony	0.006	0.003	ND	0.003	ND	0.003	ND	0.003	ND	0.003	ND	0.003	ND	0.003	ND	0.003	ND	0.003	ND
Arsenic	0.01	0.001	0.0082	0.001	0.0085	0.001	0.008	0.001	0.0087	0.001	0.0086	0.001	0.01	0.001	0.0089	0.001	0.011	0.001	0.0069
Barium	2	0.0025	0.058	0.0025	0.061	0.0025	0.066	0.0025	0.082	0.0025	0.075	0.0025	0.064	0.0025	0.062	0.0025	0.072	0.0025	0.078
Beryllium	0.004	0.001	ND ^	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND ^+	0.001	ND	0.001	ND ^+
Boron	2	5	20	5	21	5	27	5	39	5	48	5	49	5	45	5	40	5	32
Cadmium	0.005	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND
Chloride	200	2	52	2	26	2	49	2	20	4	17	2	20	2	24	2	19	2	11
Chromium	0.1	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND
Cobalt	1	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND
Copper	0.65	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	0.0026	0.002	ND
Cyanide, Total	0.2	0.01	ND	0.005	ND	0.005	ND	0.005	0.0056	0.005	ND	0.005	ND	0.005	ND	0.005	0.0055	0.005	ND
Fluoride	4	0.1	0.3	0.1	0.27	0.1	0.33	0.1	0.29	0.1	0.28	0.1	0.27	0.1	0.29	0.1	0.29	0.1	0.24
Iron	5	0.1	19	0.1	22	0.1	19	0.1	27	0.1	27	0.1	29	0.1	23	0.1	21	0.1	20
Lead	0.0075	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	0.0012	0.0005	ND
Manganese	0.15	0.0025	0.56	0.0025	0.6	0.0025	0.5	0.0025	0.73	0.0025	0.67	0.0025	0.7	0.0025	0.62	0.0025	0.52	0.0025	0.76
Mercury	0.002	0.0002	ND	0.0002	ND	0.0002	ND	0.0002	ND	0.0002	ND	0.0002	ND	0.0002	ND	0.0002	ND	0.0002	ND
Nickel	0.1	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	0.0022	0.002	ND
Nitrogen, Nitrate	10	0.1	ND	0.1	ND	0.1	ND	0.1	ND	0.1	ND	0.1	ND	0.1	ND	0.1	ND	0.1	ND
Nitrogen, Nitrate Nitrite	NA	0.1	ND	0.1	ND	0.1	ND	0.1	ND	0.1	ND	0.1	ND	0.1	ND	0.1	ND	0.1	ND
Nitrogen, Nitrite	NA	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND
Radium 226	20	0.103	0.378	0.116	0.641	0.557	ND	0.11	0.584	0.19	0.429	0.171	0.392	0.149	0.425	0.169	0.38	0.164	0.355
Radium 228	20	0.463	1.13	0.491	1.02	0.679	ND	0.515	1.5	0.571	1.89	0.429	1.15	0.45	1.72	0.614	1.16	0.543	1.4
Selenium	0.05	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND
Silver	0.05	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND
Sulfate	400	500	ND	100	510	100	710	100	960	250	1000	250	1100	250	990	100	880	250	600
Thallium	0.002	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND
Total Dissolved Solids	1,200	10	1300	150	1100	150	1800	10	1900	10	2000	10	1900	10	2000	10	1900	10	1600
Vanadium	0.049	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND
Zinc	5	0.02	ND	0.02	ND	0.02	ND	0.02	0.032	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND
pH	6.5 - 9.0	NA	6.96	NA	6.80	NA	7.01	NA	6.96	NA	6.98	NA	6.94	NA	6.96	NA	7.08	NA	6.87
Temperature	NA	NA	11.40	NA	12.00	NA	13.60	NA	11.50	NA	11.60	NA	12.70	NA	12.10	NA	11.90	NA	11.30
Conductivity	NA	NA	0.351	NA	1.982	NA	2.156	NA	2.868	NA	2.239	NA	2.257	NA	2.241	NA	2.230	NA	1.895
Dissolved Oxygen	NA	NA	0.22	NA	0.17	NA	2.10	NA	0.30	NA	0.15	NA	0.26	NA	0.20	NA	0.21	NA	0.48
ORP	NA	NA	-156.6	NA	-118.6	NA	-129.8	NA	-104.1	NA	-110.0	NA	-91.8	NA	-95.7	NA	-41.1	NA	-23.0

Notes: Standards obtained from IAC, Title 35, Chapter I, Part 620, Subpart D, Section 620.410 - Groundwater Quality Standards for Class I: Potable Resource Groundwater
All values are in mg/L (ppm) unless otherwise noted.

DL - Detection limit
* - LCS or LCSD is outside acceptable limits.
NA - Not Applicable
ND - Not Detected

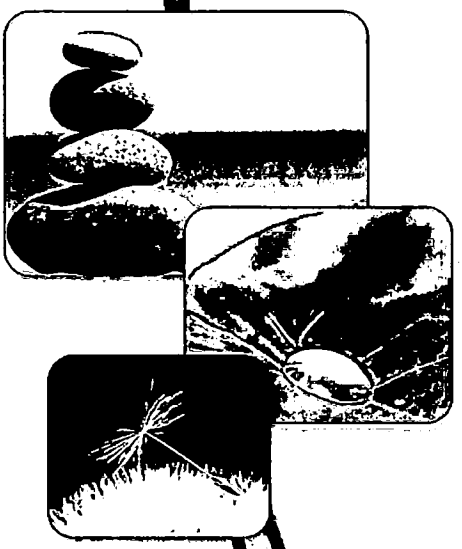
Temperature	°C	degrees Celsius
Conductivity	ms/cm	millisiemens/centimeters
Dissolved Oxygen	mg/L	milligrams/liter
Oxygen Reduction Potential (ORP)	mV	millivolts

B- Compound also detected in blank
^ - Instrument related QC outside limits.
DNYA - Data Not Yet Available

Electronic Filing: Received, Clerk's Office 10/31/2022

ATTACHMENT 1
Analytical Data Package(s)

eurofins | Environment Testing America



ANALYTICAL REPORT

Eurofins Chicago
2417 Bond Street
University Park, IL 60484
Tel: (708)534-5200

Laboratory Job ID: 500-217043-1
Client Project/Site: Waukegan Station Permit

For:
KPRG and Associates, Inc.
14665 West Lisbon Road,
Suite 1A
Brookfield, Wisconsin 53005

Attn: Richard Gnat

Diana Mockler

Authorized for release by:
6/8/2022 4:41:40 PM

Diana Mockler, Project Manager I
(219)252-7570
Diana.Mockler@et.eurofinsus.com

LINKS

Review your project results through my EOL

Have a Question? Ask The Expert

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www.eurofinsus.com/Env

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

Client: KPRG and Associates, Inc.
Project/Site: Waukegan Station Permit

Laboratory Job ID: 500-217043-1

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Case Narrative

Client: KPRG and Associates, Inc.
Project/Site: Waukegan Station Permit

Job ID: 500-217043-1

Job ID: 500-217043-1

Laboratory: Eurofins Chicago

Narrative

Job Narrative
500-217043-1

Comments
No additional comments.

Receipt
The samples were received on 5/24/2022 9:15 AM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperatures of the 6 coolers at receipt time were 0.5° C, 0.6° C, 1.0° C, 1.0° C, 1.1° C and 1.4° C.

Metals
Method 6020A: The low level continuing calibration verification (CCVL) associated with batch 500-660110 recovered above the upper control limit for Beryllium. The samples associated with this CCV were non-detects for the affected analyte; therefore, the data have been reported.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

General Chemistry
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Method Summary

Client: KPRG and Associates, Inc.
Project/Site: Waukegan Station Permit

Job ID: 500-217043-1

Method	Method Description	Protocol	Laboratory
6020A	Metals (ICP/MS)	SW846	TAL CHI
7470A	Mercury (CVAA)	SW846	TAL CHI
9012B	Cyanide, Total andor Amenable	SW846	TAL SAV
9038	Sulfate, Turbidimetric	SW846	TAL CHI
9251	Chloride	SW846	TAL CHI
Nitrate by calc	Nitrogen, Nitrate-Nitrite	SM	TAL CHI
SM 2540C	Solids, Total Dissolved (TDS)	SM	TAL CHI
SM 4500 F C	Fluoride	SM	TAL CHI
SM 4500 NO2 B	Nitrogen, Nitrite	SM	TAL CHI
SM 4500 NO3 F	Nitrogen, Nitrate	SM	TAL CHI
3005A	Preparation, Total Recoverable or Dissolved Metals	SW846	TAL CHI
7470A	Preparation, Mercury	SW846	TAL CHI
9012B	Cyanide, Total and/or Amenable, Distillation	SW846	TAL SAV

Protocol References:

SM = "Standard Methods For The Examination Of Water And Wastewater"

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL CHI = Eurofins Chicago, 2417 Bond Street, University Park, IL 60484, TEL (708)534-5200

TAL SAV = Eurofins Savannah, 5102 LaRoche Avenue, Savannah, GA 31404, TEL (912)354-7858

Sample Summary

Client: KPRG and Associates, Inc.
Project/Site: Waukegan Station Permit

Job ID: 500-217043-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
500-217043-1	MW-01	Water	05/23/22 10:59	05/24/22 09:15
500-217043-2	MW-02	Water	05/23/22 11:53	05/24/22 09:15
500-217043-3	MW-03	Water	05/23/22 12:45	05/24/22 09:15
500-217043-4	MW-04	Water	05/23/22 13:57	05/24/22 09:15
500-217043-5	Duplicate	Water	05/23/22 00:00	05/24/22 09:15
500-217043-6	MW-05	Water	05/24/22 12:11	05/25/22 09:40
500-217043-7	MW-06	Water	05/24/22 13:40	05/25/22 09:40
500-217043-8	MW-07	Water	05/24/22 13:01	05/25/22 09:40

Client Sample Results

Client: KPRG and Associates, Inc.
Project/Site: Waukegan Station Permit

Job ID: 500-217043-1

Client Sample ID: MW-01

Date Collected: 05/23/22 10:59
Date Received: 05/24/22 09:15

Lab Sample ID: 500-217043-1
Matrix: Water

Method: 6020A - Metals (ICP/MS) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.0030		0.0030		mg/L		06/02/22 08:56	06/06/22 17:50	1
Arsenic	**0.019**		0.0010		mg/L		06/02/22 08:56	06/06/22 17:50	1
Barium	**0.052**		0.0025		mg/L		06/02/22 08:56	06/06/22 17:50	1
Beryllium	<0.0010	^+	0.0010		mg/L		06/02/22 08:56	06/06/22 17:50	1
Boron	**3.0**		0.50		mg/L		06/02/22 08:56	06/07/22 12:06	10
Cadmium	<0.00050		0.00050		mg/L		06/02/22 08:56	06/06/22 17:50	1
Chromium	<0.0050		0.0050		mg/L		06/02/22 08:56	06/06/22 17:50	1
Cobalt	<0.0010		0.0010		mg/L		06/02/22 08:56	06/06/22 17:50	1
Copper	<0.0020		0.0020		mg/L		06/02/22 08:56	06/06/22 17:50	1
Iron	<0.10		0.10		mg/L		06/02/22 08:56	06/06/22 17:50	1
Lead	<0.00050		0.00050		mg/L		06/02/22 08:56	06/06/22 17:50	1
Manganese	**0.021**		0.0025		mg/L		06/02/22 08:56	06/06/22 17:50	1
Nickel	<0.0020		0.0020		mg/L		06/02/22 08:56	06/06/22 17:50	1
Selenium	<0.0025		0.0025		mg/L		06/02/22 08:56	06/06/22 17:50	1
Silver	<0.00050		0.00050		mg/L		06/02/22 08:56	06/06/22 17:50	1
Thallium	<0.0020		0.0020		mg/L		06/02/22 08:56	06/06/22 17:50	1
Vanadium	<0.0050		0.0050		mg/L		06/02/22 08:56	06/06/22 17:50	1
Zinc	<0.020		0.020		mg/L		06/02/22 08:56	06/06/22 17:50	1

Method: 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.00020		0.00020		mg/L		06/03/22 09:55	06/06/22 09:54	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Cyanide, Total	**0.0081**		0.0050		mg/L		06/03/22 09:08	06/03/22 12:38	1
Sulfate	**200**		50		mg/L			05/27/22 14:20	10
Chloride	**35**		4.0		mg/L			05/27/22 12:20	2
Nitrogen, Nitrate	<0.10		0.10		mg/L			05/27/22 20:09	1
Total Dissolved Solids	**470**		10		mg/L			05/25/22 01:06	1
Fluoride	**0.21**		0.10		mg/L			05/27/22 20:08	1
Nitrogen, Nitrite	<0.020		0.020		mg/L			05/24/22 17:32	1
Nitrogen, Nitrate Nitrite	<0.10		0.10		mg/L			05/26/22 15:20	1

Client Sample ID: MW-02

Date Collected: 05/23/22 11:53
Date Received: 05/24/22 09:15

Lab Sample ID: 500-217043-2
Matrix: Water

Method: 6020A - Metals (ICP/MS) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.0030		0.0030		mg/L		06/02/22 08:56	06/06/22 17:54	1
Arsenic	**0.010**		0.0010		mg/L		06/02/22 08:56	06/06/22 17:54	1
Barium	**0.031**		0.0025		mg/L		06/02/22 08:56	06/06/22 17:54	1
Beryllium	<0.0010	^+	0.0010		mg/L		06/02/22 08:56	06/06/22 17:54	1
Boron	**3.5**		0.50		mg/L		06/02/22 08:56	06/07/22 12:10	10
Cadmium	<0.00050		0.00050		mg/L		06/02/22 08:56	06/06/22 17:54	1
Chromium	<0.0050		0.0050		mg/L		06/02/22 08:56	06/06/22 17:54	1
Cobalt	<0.0010		0.0010		mg/L		06/02/22 08:56	06/06/22 17:54	1
Copper	<0.0020		0.0020		mg/L		06/02/22 08:56	06/06/22 17:54	1
Iron	**0.21**		0.10		mg/L		06/02/22 08:56	06/06/22 17:54	1

Client Sample Results

Client: KPRG and Associates, Inc.
Project/Site: Waukegan Station Permit

Job ID: 500-217043-1

Client Sample ID: MW-02

Lab Sample ID: 500-217043-2
Matrix: Water
Date Collected: 05/23/22 11:53
Date Received: 05/24/22 09:15

Method: 6020A - Metals (ICP/MS) - Total Recoverable (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Lead	<0.00050		0.00050		mg/L		06/02/22 08:56	06/06/22 17:54	1
Manganese	**0.087**		0.0025		mg/L		06/02/22 08:56	06/06/22 17:54	1
Nickel	<0.0020		0.0020		mg/L		06/02/22 08:56	06/06/22 17:54	1
Selenium	**0.0050**		0.0025		mg/L		06/02/22 08:56	06/06/22 17:54	1
Silver	<0.00050		0.00050		mg/L		06/02/22 08:56	06/06/22 17:54	1
Thallium	<0.0020		0.0020		mg/L		06/02/22 08:56	06/06/22 17:54	1
Vanadium	<0.0050		0.0050		mg/L		06/02/22 08:56	06/06/22 17:54	1
Zinc	<0.020		0.020		mg/L		06/02/22 08:56	06/06/22 17:54	1

Method: 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.00020		0.00020		mg/L		06/03/22 09:55	06/06/22 09:57	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Cyanide, Total	<0.0050		0.0050		mg/L		06/03/22 09:08	06/03/22 12:38	1
Sulfate	**190**		50		mg/L			05/27/22 14:21	10
Chloride	**30**		4.0		mg/L			05/27/22 12:20	2
Nitrogen, Nitrate	<0.10		0.10		mg/L			05/27/22 20:09	1
Total Dissolved Solids	**480**		10		mg/L			05/25/22 01:09	1
Fluoride	**0.47**		0.10		mg/L			05/27/22 20:16	1
Nitrogen, Nitrite	<0.020		0.020		mg/L			05/24/22 17:33	1
Nitrogen, Nitrate Nitrite	<0.10		0.10		mg/L			05/26/22 15:26	1

Client Sample ID: MW-03

Lab Sample ID: 500-217043-3
Matrix: Water
Date Collected: 05/23/22 12:45
Date Received: 05/24/22 09:15

Method: 6020A - Metals (ICP/MS) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.0030		0.0030		mg/L		06/02/22 08:56	06/06/22 17:57	1
Arsenic	**0.010**		0.0010		mg/L		06/02/22 08:56	06/06/22 17:57	1
Barium	**0.021**		0.0025		mg/L		06/02/22 08:56	06/06/22 17:57	1
Beryllium	<0.0010	^+	0.0010		mg/L		06/02/22 08:56	06/06/22 17:57	1
Boron	**2.4**		0.50		mg/L		06/02/22 08:56	06/07/22 12:13	10
Cadmium	<0.00050		0.00050		mg/L		06/02/22 08:56	06/06/22 17:57	1
Chromium	<0.0050		0.0050		mg/L		06/02/22 08:56	06/06/22 17:57	1
Cobalt	<0.0010		0.0010		mg/L		06/02/22 08:56	06/06/22 17:57	1
Copper	<0.0020		0.0020		mg/L		06/02/22 08:56	06/06/22 17:57	1
Iron	<0.10		0.10		mg/L		06/02/22 08:56	06/06/22 17:57	1
Lead	<0.00050		0.00050		mg/L		06/02/22 08:56	06/06/22 17:57	1
Manganese	**0.032**		0.0025		mg/L		06/02/22 08:56	06/06/22 17:57	1
Nickel	<0.0020		0.0020		mg/L		06/02/22 08:56	06/06/22 17:57	1
Selenium	**0.0061**		0.0025		mg/L		06/02/22 08:56	06/06/22 17:57	1
Silver	<0.00050		0.00050		mg/L		06/02/22 08:56	06/06/22 17:57	1
Thallium	<0.0020		0.0020		mg/L		06/02/22 08:56	06/06/22 17:57	1
Vanadium	<0.0050		0.0050		mg/L		06/02/22 08:56	06/06/22 17:57	1
Zinc	<0.020		0.020		mg/L		06/02/22 08:56	06/06/22 17:57	1

Client Sample Results

Client: KPRG and Associates, Inc.
Project/Site: Waukegan Station Permit

Job ID: 500-217043-1

Client Sample ID: MW-03

Lab Sample ID: 500-217043-3
Date Collected: 05/23/22 12:45
Matrix: Water
Date Received: 05/24/22 09:15

Method: 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.00020		0.00020		mg/L		06/03/22 09:55	06/06/22 09:59	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Cyanide, Total	**0.0057**		0.0050		mg/L		06/03/22 09:08	06/03/22 12:38	1
Sulfate	**180**		50		mg/L			05/27/22 14:22	10
Chloride	**32**		4.0		mg/L			05/27/22 12:52	2
Nitrogen, Nitrate	<0.10		0.10		mg/L			05/27/22 20:16	1
Total Dissolved Solids	**470**		10		mg/L			05/25/22 01:12	1
Fluoride	**0.22**		0.10		mg/L			05/27/22 20:19	1
Nitrogen, Nitrite	<0.020		0.020		mg/L			05/24/22 17:34	1
Nitrogen, Nitrate Nitrite	<0.10		0.10		mg/L			05/26/22 16:33	1

Client Sample ID: MW-04

Lab Sample ID: 500-217043-4
Date Collected: 05/23/22 13:57
Matrix: Water
Date Received: 05/24/22 09:15

Method: 6020A - Metals (ICP/MS) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.0030		0.0030		mg/L		06/02/22 08:56	06/06/22 18:01	1
Arsenic	**0.0063**		0.0010		mg/L		06/02/22 08:56	06/06/22 18:01	1
Barium	**0.041**		0.0025		mg/L		06/02/22 08:56	06/06/22 18:01	1
Beryllium	<0.0010	^+	0.0010		mg/L		06/02/22 08:56	06/06/22 18:01	1
Boron	**2.5**		0.50		mg/L		06/02/22 08:56	06/07/22 12:17	10
Cadmium	<0.00050		0.00050		mg/L		06/02/22 08:56	06/06/22 18:01	1
Chromium	<0.0050		0.0050		mg/L		06/02/22 08:56	06/06/22 18:01	1
Cobalt	<0.0010		0.0010		mg/L		06/02/22 08:56	06/06/22 18:01	1
Copper	<0.0020		0.0020		mg/L		06/02/22 08:56	06/06/22 18:01	1
Iron	**0.11**		0.10		mg/L		06/02/22 08:56	06/06/22 18:01	1
Lead	<0.00050		0.00050		mg/L		06/02/22 08:56	06/06/22 18:01	1
Manganese	**0.097**		0.0025		mg/L		06/02/22 08:56	06/06/22 18:01	1
Nickel	<0.0020		0.0020		mg/L		06/02/22 08:56	06/06/22 18:01	1
Selenium	<0.0025		0.0025		mg/L		06/02/22 08:56	06/06/22 18:01	1
Silver	<0.00050		0.00050		mg/L		06/02/22 08:56	06/06/22 18:01	1
Thallium	<0.0020		0.0020		mg/L		06/02/22 08:56	06/06/22 18:01	1
Vanadium	<0.0050		0.0050		mg/L		06/02/22 08:56	06/06/22 18:01	1
Zinc	<0.020		0.020		mg/L		06/02/22 08:56	06/06/22 18:01	1

Method: 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.00020		0.00020		mg/L		06/03/22 09:55	06/06/22 10:01	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Cyanide, Total	**0.0088**		0.0050		mg/L		06/03/22 09:08	06/03/22 12:38	1
Sulfate	**160**		50		mg/L			05/27/22 14:22	10
Chloride	**41**		4.0		mg/L			05/27/22 12:53	2
Nitrogen, Nitrate	<0.10		0.10		mg/L			05/27/22 20:16	1
Total Dissolved Solids	**500**		10		mg/L			05/25/22 01:14	1
Fluoride	**0.57**		0.10		mg/L			05/27/22 20:23	1
Nitrogen, Nitrite	<0.020		0.020		mg/L			05/24/22 17:34	1

Client Sample Results

Client: KPRG and Associates, Inc.
Project/Site: Waukegan Station Permit

Job ID: 500-217043-1

Client Sample ID: MW-04

Lab Sample ID: 500-217043-4
Matrix: Water
Date Collected: 05/23/22 13:57
Date Received: 05/24/22 09:15

General Chemistry (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Nitrogen, Nitrate Nitrite	<0.10		0.10		mg/L			05/26/22 16:35	1

Client Sample ID: Duplicate

Lab Sample ID: 500-217043-5
Matrix: Water
Date Collected: 05/23/22 00:00
Date Received: 05/24/22 09:15

Method: 6020A - Metals (ICP/MS) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.0030		0.0030		mg/L		06/02/22 08:56	06/06/22 18:04	1
Arsenic	**0.0087**		0.0010		mg/L		06/02/22 08:56	06/06/22 18:04	1
Barium	**0.021**		0.0025		mg/L		06/02/22 08:56	06/06/22 18:04	1
Beryllium	<0.0010	^+	0.0010		mg/L		06/02/22 08:56	06/06/22 18:04	1
Boron	**2.5**		0.50		mg/L		06/02/22 08:56	06/07/22 12:20	10
Cadmium	<0.00050		0.00050		mg/L		06/02/22 08:56	06/06/22 18:04	1
Chromium	<0.0050		0.0050		mg/L		06/02/22 08:56	06/06/22 18:04	1
Cobalt	<0.0010		0.0010		mg/L		06/02/22 08:56	06/06/22 18:04	1
Copper	<0.0020		0.0020		mg/L		06/02/22 08:56	06/06/22 18:04	1
Iron	<0.10		0.10		mg/L		06/02/22 08:56	06/06/22 18:04	1
Lead	<0.00050		0.00050		mg/L		06/02/22 08:56	06/06/22 18:04	1
Manganese	**0.030**		0.0025		mg/L		06/02/22 08:56	06/06/22 18:04	1
Nickel	<0.0020		0.0020		mg/L		06/02/22 08:56	06/06/22 18:04	1
Selenium	**0.0063**		0.0025		mg/L		06/02/22 08:56	06/06/22 18:04	1
Silver	<0.00050		0.00050		mg/L		06/02/22 08:56	06/06/22 18:04	1
Thallium	<0.0020		0.0020		mg/L		06/02/22 08:56	06/06/22 18:04	1
Vanadium	<0.0050		0.0050		mg/L		06/02/22 08:56	06/06/22 18:04	1
Zinc	<0.020		0.020		mg/L		06/02/22 08:56	06/06/22 18:04	1

Method: 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.00020		0.00020		mg/L		06/03/22 09:55	06/06/22 10:03	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Cyanide, Total	**0.0052**		0.0050		mg/L		06/03/22 09:08	06/03/22 12:38	1
Sulfate	<250		250		mg/L			05/27/22 14:22	50
Chloride	**32**		2.0		mg/L			05/27/22 12:53	1
Nitrogen, Nitrate	<0.10		0.10		mg/L			05/27/22 20:16	1
Total Dissolved Solids	**460**		10		mg/L			05/25/22 01:17	1
Fluoride	**0.22**		0.10		mg/L			05/27/22 20:36	1
Nitrogen, Nitrite	<0.020		0.020		mg/L			05/24/22 17:35	1
Nitrogen, Nitrate Nitrite	<0.10		0.10		mg/L			05/26/22 16:37	1

Client Sample ID: MW-05

Lab Sample ID: 500-217043-6
Matrix: Water
Date Collected: 05/24/22 12:11
Date Received: 05/25/22 09:40

Method: 6020A - Metals (ICP/MS) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.0030		0.0030		mg/L		06/02/22 08:56	06/06/22 18:07	1
Arsenic	**0.0071**		0.0010		mg/L		06/02/22 08:56	06/06/22 18:07	1
Barium	**0.031**		0.0025		mg/L		06/02/22 08:56	06/06/22 18:07	1

Client Sample Results

Client: KPRG and Associates, Inc.
Project/Site: Waukegan Station Permit

Job ID: 500-217043-1

Client Sample ID: MW-05

Date Collected: 05/24/22 12:11
Date Received: 05/25/22 09:40

Lab Sample ID: 500-217043-6
Matrix: Water

Method: 6020A - Metals (ICP/MS) - Total Recoverable (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Beryllium	<0.0010	^+	0.0010		mg/L		06/02/22 08:56	06/06/22 18:07	1
Boron	**8.7**		1.0		mg/L		06/02/22 08:56	06/07/22 12:24	20
Cadmium	<0.00050		0.00050		mg/L		06/02/22 08:56	06/06/22 18:07	1
Chromium	<0.0050		0.0050		mg/L		06/02/22 08:56	06/06/22 18:07	1
Cobalt	<0.0010		0.0010		mg/L		06/02/22 08:56	06/06/22 18:07	1
Copper	<0.0020		0.0020		mg/L		06/02/22 08:56	06/06/22 18:07	1
Iron	**1.8**		0.10		mg/L		06/02/22 08:56	06/06/22 18:07	1
Lead	<0.00050		0.00050		mg/L		06/02/22 08:56	06/06/22 18:07	1
Manganese	**0.28**		0.0025		mg/L		06/02/22 08:56	06/06/22 18:07	1
Nickel	**0.0034**		0.0020		mg/L		06/02/22 08:56	06/06/22 18:07	1
Selenium	**0.0071**		0.0025		mg/L		06/02/22 08:56	06/06/22 18:07	1
Silver	<0.00050		0.00050		mg/L		06/02/22 08:56	06/06/22 18:07	1
Thallium	<0.0020		0.0020		mg/L		06/02/22 08:56	06/06/22 18:07	1
Vanadium	<0.0050		0.0050		mg/L		06/02/22 08:56	06/06/22 18:07	1
Zinc	<0.020		0.020		mg/L		06/02/22 08:56	06/06/22 18:07	1

Method: 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.00020		0.00020		mg/L		06/03/22 09:55	06/06/22 10:05	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Cyanide, Total	<0.0050		0.0050		mg/L		06/03/22 09:08	06/03/22 12:45	1
Sulfate	**990**		250		mg/L			05/27/22 14:23	50
Chloride	**9.9**		2.0		mg/L			05/27/22 12:53	1
Nitrogen, Nitrate	<0.10		0.10		mg/L			05/27/22 20:16	1
Total Dissolved Solids	**2400**		10		mg/L			05/31/22 00:01	1
Fluoride	**0.16**		0.10		mg/L			05/27/22 20:40	1
Nitrogen, Nitrite	<0.020		0.020		mg/L			05/25/22 12:57	1
Nitrogen, Nitrate Nitrite	<0.10		0.10		mg/L			05/26/22 16:39	1

Client Sample ID: MW-06

Date Collected: 05/24/22 13:40
Date Received: 05/25/22 09:40

Lab Sample ID: 500-217043-7
Matrix: Water

Method: 6020A - Metals (ICP/MS) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.0030		0.0030		mg/L		06/02/22 08:56	06/06/22 18:11	1
Arsenic	**0.0013**		0.0010		mg/L		06/02/22 08:56	06/06/22 18:11	1
Barium	**0.082**		0.0025		mg/L		06/02/22 08:56	06/06/22 18:11	1
Beryllium	<0.0010	^+	0.0010		mg/L		06/02/22 08:56	06/06/22 18:11	1
Boron	**3.1**		0.50		mg/L		06/02/22 08:56	06/07/22 12:27	10
Cadmium	<0.00050		0.00050		mg/L		06/02/22 08:56	06/06/22 18:11	1
Chromium	<0.0050		0.0050		mg/L		06/02/22 08:56	06/06/22 18:11	1
Cobalt	<0.0010		0.0010		mg/L		06/02/22 08:56	06/06/22 18:11	1
Copper	<0.0020		0.0020		mg/L		06/02/22 08:56	06/06/22 18:11	1
Iron	**3.6**		0.10		mg/L		06/02/22 08:56	06/06/22 18:11	1
Lead	<0.00050		0.00050		mg/L		06/02/22 08:56	06/06/22 18:11	1
Manganese	**0.25**		0.0025		mg/L		06/02/22 08:56	06/06/22 18:11	1
Nickel	<0.0020		0.0020		mg/L		06/02/22 08:56	06/06/22 18:11	1

Client Sample Results

Client: KPRG and Associates, Inc.
Project/Site: Waukegan Station Permit

Job ID: 500-217043-1

Client Sample ID: MW-06

Lab Sample ID: 500-217043-7
Matrix: Water
Date Collected: 05/24/22 13:40
Date Received: 05/25/22 09:40

Method: 6020A - Metals (ICP/MS) - Total Recoverable (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Selenium	<0.0025		0.0025		mg/L		06/02/22 08:56	06/06/22 18:11	1
Silver	<0.00050		0.00050		mg/L		06/02/22 08:56	06/06/22 18:11	1
Thallium	<0.0020		0.0020		mg/L		06/02/22 08:56	06/06/22 18:11	1
Vanadium	<0.0050		0.0050		mg/L		06/02/22 08:56	06/06/22 18:11	1
Zinc	<0.020		0.020		mg/L		06/02/22 08:56	06/06/22 18:11	1

Method: 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.00020		0.00020		mg/L		06/03/22 09:55	06/06/22 10:07	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Cyanide, Total	<0.0050		0.0050		mg/L		06/03/22 09:08	06/03/22 12:45	1
Sulfate	**110**		25		mg/L			05/27/22 14:53	5
Chloride	**37**		4.0		mg/L			05/27/22 12:53	2
Nitrogen, Nitrate	<0.10		0.10		mg/L			05/27/22 20:16	1
Total Dissolved Solids	**580**		10		mg/L			05/31/22 00:03	1
Fluoride	**0.30**		0.10		mg/L			05/27/22 20:43	1
Nitrogen, Nitrite	<0.020		0.020		mg/L			05/25/22 12:57	1
Nitrogen, Nitrate Nitrite	<0.10		0.10		mg/L			05/26/22 16:41	1

Client Sample ID: MW-07

Lab Sample ID: 500-217043-8
Matrix: Water
Date Collected: 05/24/22 13:01
Date Received: 05/25/22 09:40

Method: 6020A - Metals (ICP/MS) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.0030		0.0030		mg/L		06/02/22 08:56	06/06/22 18:14	1
Arsenic	**0.0069**		0.0010		mg/L		06/02/22 08:56	06/06/22 18:14	1
Barium	**0.078**		0.0025		mg/L		06/02/22 08:56	06/06/22 18:14	1
Beryllium	<0.0010	^+	0.0010		mg/L		06/02/22 08:56	06/06/22 18:14	1
Boron	**32**		5.0		mg/L		06/02/22 08:56	06/07/22 12:30	100
Cadmium	<0.00050		0.00050		mg/L		06/02/22 08:56	06/06/22 18:14	1
Chromium	<0.0050		0.0050		mg/L		06/02/22 08:56	06/06/22 18:14	1
Cobalt	<0.0010		0.0010		mg/L		06/02/22 08:56	06/06/22 18:14	1
Copper	<0.0020		0.0020		mg/L		06/02/22 08:56	06/06/22 18:14	1
Iron	**20**		0.10		mg/L		06/02/22 08:56	06/06/22 18:14	1
Lead	<0.00050		0.00050		mg/L		06/02/22 08:56	06/06/22 18:14	1
Manganese	**0.76**		0.0025		mg/L		06/02/22 08:56	06/06/22 18:14	1
Nickel	<0.0020		0.0020		mg/L		06/02/22 08:56	06/06/22 18:14	1
Selenium	<0.0025		0.0025		mg/L		06/02/22 08:56	06/06/22 18:14	1
Silver	<0.00050		0.00050		mg/L		06/02/22 08:56	06/06/22 18:14	1
Thallium	<0.0020		0.0020		mg/L		06/02/22 08:56	06/06/22 18:14	1
Vanadium	<0.0050		0.0050		mg/L		06/02/22 08:56	06/06/22 18:14	1
Zinc	<0.020		0.020		mg/L		06/02/22 08:56	06/06/22 18:14	1

Method: 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.00020		0.00020		mg/L		06/03/22 09:55	06/06/22 10:09	1

Client Sample Results

Client: KPRG and Associates, Inc.
Project/Site: Waukegan Station Permit

Job ID: 500-217043-1

Client Sample ID: MW-07
Date Collected: 05/24/22 13:01
Date Received: 05/25/22 09:40

Lab Sample ID: 500-217043-8
Matrix: Water

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Cyanide, Total	<0.0050		0.0050		mg/L		06/03/22 09:08	06/03/22 13:00	1
Sulfate	**600**		250		mg/L			05/27/22 14:54	50
Chloride	**11**		2.0		mg/L			05/27/22 12:53	1
Nitrogen, Nitrate	<0.10		0.10		mg/L			05/27/22 20:16	1
Total Dissolved Solids	**1600**		10		mg/L			05/31/22 00:06	1
Fluoride	**0.24**		0.10		mg/L			05/27/22 20:46	1
Nitrogen, Nitrite	<0.020		0.020		mg/L			05/25/22 12:58	1
Nitrogen, Nitrate Nitrite	<0.10		0.10		mg/L			05/26/22 16:43	1

Definitions/Glossary

Client: KPRG and Associates, Inc. Job ID: 500-217043-1
Project/Site: Waukegan Station Permit

Qualifiers

Metals

Qualifier	Qualifier Description
^+	Continuing Calibration Verification (CCV) is outside acceptance limits, high biased.

General Chemistry

Qualifier	Qualifier Description
4	MS, MSD: The analyte present in the original sample is greater than 4 times the matrix spike concentration; therefore, control limits are not applicable.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

QC Association Summary

Client: KPRG and Associates, Inc.
Project/Site: Waukegan Station Permit

Job ID: 500-217043-1

Metals

Prep Batch: 659524

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-217043-1	MW-01	Total Recoverable	Water	3005A	
500-217043-2	MW-02	Total Recoverable	Water	3005A	
500-217043-3	MW-03	Total Recoverable	Water	3005A	
500-217043-4	MW-04	Total Recoverable	Water	3005A	
500-217043-5	Duplicate	Total Recoverable	Water	3005A	
500-217043-6	MW-05	Total Recoverable	Water	3005A	
500-217043-7	MW-06	Total Recoverable	Water	3005A	
500-217043-8	MW-07	Total Recoverable	Water	3005A	
MB 500-659524/1-A	Method Blank	Total Recoverable	Water	3005A	
LCS 500-659524/2-A	Lab Control Sample	Total Recoverable	Water	3005A	

Prep Batch: 659757

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-217043-1	MW-01	Total/NA	Water	7470A	
500-217043-2	MW-02	Total/NA	Water	7470A	
500-217043-3	MW-03	Total/NA	Water	7470A	
500-217043-4	MW-04	Total/NA	Water	7470A	
500-217043-5	Duplicate	Total/NA	Water	7470A	
500-217043-6	MW-05	Total/NA	Water	7470A	
500-217043-7	MW-06	Total/NA	Water	7470A	
500-217043-8	MW-07	Total/NA	Water	7470A	
MB 500-659757/12-A	Method Blank	Total/NA	Water	7470A	
LCS 500-659757/13-A	Lab Control Sample	Total/NA	Water	7470A	

Analysis Batch: 659994

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-217043-1	MW-01	Total/NA	Water	7470A	659757
500-217043-2	MW-02	Total/NA	Water	7470A	659757
500-217043-3	MW-03	Total/NA	Water	7470A	659757
500-217043-4	MW-04	Total/NA	Water	7470A	659757
500-217043-5	Duplicate	Total/NA	Water	7470A	659757
500-217043-6	MW-05	Total/NA	Water	7470A	659757
500-217043-7	MW-06	Total/NA	Water	7470A	659757
500-217043-8	MW-07	Total/NA	Water	7470A	659757
MB 500-659757/12-A	Method Blank	Total/NA	Water	7470A	659757
LCS 500-659757/13-A	Lab Control Sample	Total/NA	Water	7470A	659757

Analysis Batch: 660110

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-217043-1	MW-01	Total Recoverable	Water	6020A	659524
500-217043-2	MW-02	Total Recoverable	Water	6020A	659524
500-217043-3	MW-03	Total Recoverable	Water	6020A	659524
500-217043-4	MW-04	Total Recoverable	Water	6020A	659524
500-217043-5	Duplicate	Total Recoverable	Water	6020A	659524
500-217043-6	MW-05	Total Recoverable	Water	6020A	659524
500-217043-7	MW-06	Total Recoverable	Water	6020A	659524
500-217043-8	MW-07	Total Recoverable	Water	6020A	659524
MB 500-659524/1-A	Method Blank	Total Recoverable	Water	6020A	659524
LCS 500-659524/2-A	Lab Control Sample	Total Recoverable	Water	6020A	659524

QC Association Summary

Client: KPRG and Associates, Inc.
Project/Site: Waukegan Station Permit

Job ID: 500-217043-1

Metals

Analysis Batch: 660193

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-217043-1	MW-01	Total Recoverable	Water	6020A	659524
500-217043-2	MW-02	Total Recoverable	Water	6020A	659524
500-217043-3	MW-03	Total Recoverable	Water	6020A	659524
500-217043-4	MW-04	Total Recoverable	Water	6020A	659524
500-217043-5	Duplicate	Total Recoverable	Water	6020A	659524
500-217043-6	MW-05	Total Recoverable	Water	6020A	659524
500-217043-7	MW-06	Total Recoverable	Water	6020A	659524
500-217043-8	MW-07	Total Recoverable	Water	6020A	659524
MB 500-659524/1-A	Method Blank	Total Recoverable	Water	6020A	659524
LCS 500-659524/2-A	Lab Control Sample	Total Recoverable	Water	6020A	659524

General Chemistry

Analysis Batch: 658340

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-217043-1	MW-01	Total/NA	Water	SM 4500 NO2 B	
500-217043-2	MW-02	Total/NA	Water	SM 4500 NO2 B	
500-217043-3	MW-03	Total/NA	Water	SM 4500 NO2 B	
500-217043-4	MW-04	Total/NA	Water	SM 4500 NO2 B	
500-217043-5	Duplicate	Total/NA	Water	SM 4500 NO2 B	
MB 500-658340/9	Method Blank	Total/NA	Water	SM 4500 NO2 B	
LCS 500-658340/10	Lab Control Sample	Total/NA	Water	SM 4500 NO2 B	
500-217043-1 MS	MW-01	Total/NA	Water	SM 4500 NO2 B	
500-217043-1 MSD	MW-01	Total/NA	Water	SM 4500 NO2 B	

Analysis Batch: 658372

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-217043-1	MW-01	Total/NA	Water	SM 2540C	
500-217043-2	MW-02	Total/NA	Water	SM 2540C	
500-217043-3	MW-03	Total/NA	Water	SM 2540C	
500-217043-4	MW-04	Total/NA	Water	SM 2540C	
500-217043-5	Duplicate	Total/NA	Water	SM 2540C	
MB 500-658372/1	Method Blank	Total/NA	Water	SM 2540C	
LCS 500-658372/2	Lab Control Sample	Total/NA	Water	SM 2540C	

Analysis Batch: 658504

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-217043-6	MW-05	Total/NA	Water	SM 4500 NO2 B	
500-217043-7	MW-06	Total/NA	Water	SM 4500 NO2 B	
500-217043-8	MW-07	Total/NA	Water	SM 4500 NO2 B	
MB 500-658504/9	Method Blank	Total/NA	Water	SM 4500 NO2 B	
LCS 500-658504/10	Lab Control Sample	Total/NA	Water	SM 4500 NO2 B	

Analysis Batch: 658789

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-217043-1	MW-01	Total/NA	Water	SM 4500 NO3 F	
500-217043-2	MW-02	Total/NA	Water	SM 4500 NO3 F	
500-217043-3	MW-03	Total/NA	Water	SM 4500 NO3 F	
500-217043-4	MW-04	Total/NA	Water	SM 4500 NO3 F	
500-217043-5	Duplicate	Total/NA	Water	SM 4500 NO3 F	
500-217043-6	MW-05	Total/NA	Water	SM 4500 NO3 F	

QC Association Summary

Client: KPRG and Associates, Inc.
Project/Site: Waukegan Station Permit

Job ID: 500-217043-1

General Chemistry (Continued)

Analysis Batch: 658789 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-217043-7	MW-06	Total/NA	Water	SM 4500 NO3 F	
500-217043-8	MW-07	Total/NA	Water	SM 4500 NO3 F	
MB 500-658789/49	Method Blank	Total/NA	Water	SM 4500 NO3 F	
LCS 500-658789/50	Lab Control Sample	Total/NA	Water	SM 4500 NO3 F	
500-217043-1 MS	MW-01	Total/NA	Water	SM 4500 NO3 F	
500-217043-1 MSD	MW-01	Total/NA	Water	SM 4500 NO3 F	

Analysis Batch: 658951

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-217043-1	MW-01	Total/NA	Water	9251	
500-217043-2	MW-02	Total/NA	Water	9251	
500-217043-3	MW-03	Total/NA	Water	9251	
500-217043-4	MW-04	Total/NA	Water	9251	
500-217043-5	Duplicate	Total/NA	Water	9251	
500-217043-6	MW-05	Total/NA	Water	9251	
500-217043-7	MW-06	Total/NA	Water	9251	
500-217043-8	MW-07	Total/NA	Water	9251	
MB 500-658951/16	Method Blank	Total/NA	Water	9251	
MB 500-658951/58	Method Blank	Total/NA	Water	9251	
LCS 500-658951/17	Lab Control Sample	Total/NA	Water	9251	
LCS 500-658951/59	Lab Control Sample	Total/NA	Water	9251	
500-217043-3 MS	MW-03	Total/NA	Water	9251	
500-217043-3 MSD	MW-03	Total/NA	Water	9251	

Analysis Batch: 658956

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-217043-1	MW-01	Total/NA	Water	9038	
500-217043-2	MW-02	Total/NA	Water	9038	
500-217043-3	MW-03	Total/NA	Water	9038	
500-217043-4	MW-04	Total/NA	Water	9038	
500-217043-5	Duplicate	Total/NA	Water	9038	
500-217043-6	MW-05	Total/NA	Water	9038	
500-217043-7	MW-06	Total/NA	Water	9038	
500-217043-8	MW-07	Total/NA	Water	9038	
MB 500-658956/16	Method Blank	Total/NA	Water	9038	
LCS 500-658956/17	Lab Control Sample	Total/NA	Water	9038	
500-217043-1 MS	MW-01	Total/NA	Water	9038	
500-217043-1 MSD	MW-01	Total/NA	Water	9038	

Analysis Batch: 658975

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-217043-1	MW-01	Total/NA	Water	Nitrate by calc	
500-217043-2	MW-02	Total/NA	Water	Nitrate by calc	
500-217043-3	MW-03	Total/NA	Water	Nitrate by calc	
500-217043-4	MW-04	Total/NA	Water	Nitrate by calc	
500-217043-5	Duplicate	Total/NA	Water	Nitrate by calc	
500-217043-6	MW-05	Total/NA	Water	Nitrate by calc	
500-217043-7	MW-06	Total/NA	Water	Nitrate by calc	
500-217043-8	MW-07	Total/NA	Water	Nitrate by calc	

QC Association Summary

Client: KPRG and Associates, Inc.
Project/Site: Waukegan Station Permit

Job ID: 500-217043-1

General Chemistry

Analysis Batch: 659084

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-217043-1	MW-01	Total/NA	Water	SM 4500 F C	
500-217043-2	MW-02	Total/NA	Water	SM 4500 F C	
500-217043-3	MW-03	Total/NA	Water	SM 4500 F C	
500-217043-4	MW-04	Total/NA	Water	SM 4500 F C	
500-217043-5	Duplicate	Total/NA	Water	SM 4500 F C	
500-217043-6	MW-05	Total/NA	Water	SM 4500 F C	
500-217043-7	MW-06	Total/NA	Water	SM 4500 F C	
500-217043-8	MW-07	Total/NA	Water	SM 4500 F C	
MB 500-659084/3	Method Blank	Total/NA	Water	SM 4500 F C	
LCS 500-659084/4	Lab Control Sample	Total/NA	Water	SM 4500 F C	
500-217043-1 MS	MW-01	Total/NA	Water	SM 4500 F C	
500-217043-1 MSD	MW-01	Total/NA	Water	SM 4500 F C	

Analysis Batch: 659110

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-217043-6	MW-05	Total/NA	Water	SM 2540C	
500-217043-7	MW-06	Total/NA	Water	SM 2540C	
500-217043-8	MW-07	Total/NA	Water	SM 2540C	
MB 500-659110/1	Method Blank	Total/NA	Water	SM 2540C	
LCS 500-659110/2	Lab Control Sample	Total/NA	Water	SM 2540C	

Prep Batch: 724015

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-217043-1	MW-01	Total/NA	Water	9012B	
500-217043-2	MW-02	Total/NA	Water	9012B	
500-217043-3	MW-03	Total/NA	Water	9012B	
500-217043-4	MW-04	Total/NA	Water	9012B	
500-217043-5	Duplicate	Total/NA	Water	9012B	
500-217043-6	MW-05	Total/NA	Water	9012B	
500-217043-7	MW-06	Total/NA	Water	9012B	
500-217043-8	MW-07	Total/NA	Water	9012B	
MB 680-724015/12-A	Method Blank	Total/NA	Water	9012B	
LCS 680-724015/13-A	Lab Control Sample	Total/NA	Water	9012B	
500-217043-1 MS	MW-01	Total/NA	Water	9012B	
500-217043-1 MSD	MW-01	Total/NA	Water	9012B	

Analysis Batch: 724141

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-217043-1	MW-01	Total/NA	Water	9012B	724015
500-217043-2	MW-02	Total/NA	Water	9012B	724015
500-217043-3	MW-03	Total/NA	Water	9012B	724015
500-217043-4	MW-04	Total/NA	Water	9012B	724015
500-217043-5	Duplicate	Total/NA	Water	9012B	724015
500-217043-6	MW-05	Total/NA	Water	9012B	724015
500-217043-7	MW-06	Total/NA	Water	9012B	724015
500-217043-8	MW-07	Total/NA	Water	9012B	724015
MB 680-724015/12-A	Method Blank	Total/NA	Water	9012B	724015
LCS 680-724015/13-A	Lab Control Sample	Total/NA	Water	9012B	724015
500-217043-1 MS	MW-01	Total/NA	Water	9012B	724015
500-217043-1 MSD	MW-01	Total/NA	Water	9012B	724015

QC Sample Results

Client: KPRG and Associates, Inc.
Project/Site: Waukegan Station Permit

Job ID: 500-217043-1

Method: 6020A - Metals (ICP/MS)

Lab Sample ID: MB 500-659524/1-A
Matrix: Water
Analysis Batch: 660110

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 659524

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.0030		0.0030		mg/L		06/02/22 08:56	06/06/22 16:38	1
Arsenic	<0.0010		0.0010		mg/L		06/02/22 08:56	06/06/22 16:38	1
Barium	<0.0025		0.0025		mg/L		06/02/22 08:56	06/06/22 16:38	1
Beryllium	<0.0010	^+	0.0010		mg/L		06/02/22 08:56	06/06/22 16:38	1
Cadmium	<0.00050		0.00050		mg/L		06/02/22 08:56	06/06/22 16:38	1
Chromium	<0.0050		0.0050		mg/L		06/02/22 08:56	06/06/22 16:38	1
Cobalt	<0.0010		0.0010		mg/L		06/02/22 08:56	06/06/22 16:38	1
Copper	<0.0020		0.0020		mg/L		06/02/22 08:56	06/06/22 16:38	1
Iron	<0.10		0.10		mg/L		06/02/22 08:56	06/06/22 16:38	1
Lead	<0.00050		0.00050		mg/L		06/02/22 08:56	06/06/22 16:38	1
Manganese	<0.0025		0.0025		mg/L		06/02/22 08:56	06/06/22 16:38	1
Nickel	<0.0020		0.0020		mg/L		06/02/22 08:56	06/06/22 16:38	1
Selenium	<0.0025		0.0025		mg/L		06/02/22 08:56	06/06/22 16:38	1
Silver	<0.00050		0.00050		mg/L		06/02/22 08:56	06/06/22 16:38	1
Thallium	<0.0020		0.0020		mg/L		06/02/22 08:56	06/06/22 16:38	1
Vanadium	<0.0050		0.0050		mg/L		06/02/22 08:56	06/06/22 16:38	1
Zinc	<0.020		0.020		mg/L		06/02/22 08:56	06/06/22 16:38	1

Lab Sample ID: MB 500-659524/1-A
Matrix: Water
Analysis Batch: 660193

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 659524

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	<0.050		0.050		mg/L		06/02/22 08:56	06/07/22 11:57	1

Lab Sample ID: LCS 500-659524/2-A
Matrix: Water
Analysis Batch: 660110

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 659524

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Antimony	0.500	0.486		mg/L		97	80 - 120
Arsenic	0.100	0.0977		mg/L		98	80 - 120
Barium	0.500	0.511		mg/L		102	80 - 120
Beryllium	0.0500	0.0505	^+	mg/L		101	80 - 120
Cadmium	0.0500	0.0479		mg/L		96	80 - 120
Chromium	0.200	0.207		mg/L		103	80 - 120
Cobalt	0.500	0.518		mg/L		104	80 - 120
Copper	0.250	0.258		mg/L		103	80 - 120
Iron	1.00	1.03		mg/L		103	80 - 120
Lead	0.100	0.107		mg/L		107	80 - 120
Manganese	0.500	0.503		mg/L		101	80 - 120
Nickel	0.500	0.511		mg/L		102	80 - 120
Selenium	0.100	0.0953		mg/L		95	80 - 120
Silver	0.0500	0.0519		mg/L		104	80 - 120
Thallium	0.100	0.103		mg/L		103	80 - 120
Vanadium	0.500	0.501		mg/L		100	80 - 120
Zinc	0.500	0.510		mg/L		102	80 - 120

QC Sample Results

Client: KPRG and Associates, Inc.
Project/Site: Waukegan Station Permit

Job ID: 500-217043-1

Method: 6020A - Metals (ICP/MS) (Continued)

Lab Sample ID: LCS 500-659524/2-A
Matrix: Water
Analysis Batch: 660193

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 659524

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Boron	1.00	1.01		mg/L		101	80 - 120

Method: 7470A - Mercury (CVAA)

Lab Sample ID: MB 500-659757/12-A
Matrix: Water
Analysis Batch: 659994

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 659757

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.00020		0.00020		mg/L		06/03/22 09:55	06/06/22 08:27	1

Lab Sample ID: LCS 500-659757/13-A
Matrix: Water
Analysis Batch: 659994

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 659757

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Mercury	0.00200	0.00216		mg/L		108	80 - 120

Method: 9012B - Cyanide, Total andor Amenable

Lab Sample ID: MB 680-724015/12-A
Matrix: Water
Analysis Batch: 724141

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 724015

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Cyanide, Total	<0.0050		0.0050		mg/L		06/03/22 09:08	06/03/22 12:38	1

Lab Sample ID: LCS 680-724015/13-A
Matrix: Water
Analysis Batch: 724141

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 724015

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Cyanide, Total	0.0500	0.0464		mg/L		93	85 - 115

Lab Sample ID: 500-217043-1 MS
Matrix: Water
Analysis Batch: 724141

Client Sample ID: MW-01
Prep Type: Total/NA
Prep Batch: 724015

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits
Cyanide, Total	0.0081		0.0500	0.0512		mg/L		86	85 - 115

Lab Sample ID: 500-217043-1 MSD
Matrix: Water
Analysis Batch: 724141

Client Sample ID: MW-01
Prep Type: Total/NA
Prep Batch: 724015

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Cyanide, Total	0.0081		0.0500	0.0511		mg/L		86	85 - 115	0	20

QC Sample Results

Client: KPRG and Associates, Inc.
Project/Site: Waukegan Station Permit

Job ID: 500-217043-1

Method: 9038 - Sulfate, Turbidimetric

Lab Sample ID: MB 500-658956/16
Matrix: Water
Analysis Batch: 658956

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfate	<5.0		5.0		mg/L			05/27/22 14:19	1

Lab Sample ID: LCS 500-658956/17
Matrix: Water
Analysis Batch: 658956

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Sulfate	20.0	20.4		mg/L		102	88 - 123

Lab Sample ID: 500-217043-1 MS
Matrix: Water
Analysis Batch: 658956

Client Sample ID: MW-01
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits
Sulfate	200		20.0	222	4	mg/L		91	75 - 125

Lab Sample ID: 500-217043-1 MSD
Matrix: Water
Analysis Batch: 658956

Client Sample ID: MW-01
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Sulfate	200		20.0	221	4	mg/L		88	75 - 125	0	20

Method: 9251 - Chloride

Lab Sample ID: MB 500-658951/16
Matrix: Water
Analysis Batch: 658951

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	<2.0		2.0		mg/L			05/27/22 12:13	1

Lab Sample ID: MB 500-658951/58
Matrix: Water
Analysis Batch: 658951

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	<2.0		2.0		mg/L			05/27/22 12:51	1

Lab Sample ID: LCS 500-658951/17
Matrix: Water
Analysis Batch: 658951

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Chloride	20.0	20.6		mg/L		103	80 - 120

QC Sample Results

Client: KPRG and Associates, Inc.
Project/Site: Waukegan Station Permit

Job ID: 500-217043-1

Method: 9251 - Chloride (Continued)

Lab Sample ID: LCS 500-658951/59
Matrix: Water
Analysis Batch: 658951

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Chloride	20.0	20.7		mg/L		103	80 - 120

Lab Sample ID: 500-217043-3 MS
Matrix: Water
Analysis Batch: 658951

Client Sample ID: MW-03
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits
Chloride	32		20.0	49.4		mg/L		88	75 - 125

Lab Sample ID: 500-217043-3 MSD
Matrix: Water
Analysis Batch: 658951

Client Sample ID: MW-03
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Chloride	32		20.0	49.4		mg/L		88	75 - 125	0	20

Method: SM 2540C - Solids, Total Dissolved (TDS)

Lab Sample ID: MB 500-658372/1
Matrix: Water
Analysis Batch: 658372

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	<10		10		mg/L			05/25/22 00:23	1

Lab Sample ID: LCS 500-658372/2
Matrix: Water
Analysis Batch: 658372

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Total Dissolved Solids	250	268		mg/L		107	80 - 120

Lab Sample ID: MB 500-659110/1
Matrix: Water
Analysis Batch: 659110

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	<10		10		mg/L			05/30/22 23:51	1

Lab Sample ID: LCS 500-659110/2
Matrix: Water
Analysis Batch: 659110

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Total Dissolved Solids	250	278		mg/L		111	80 - 120

QC Sample Results

Client: KPRG and Associates, Inc.
Project/Site: Waukegan Station Permit

Job ID: 500-217043-1

Method: SM 4500 F C - Fluoride

Lab Sample ID: MB 500-659084/3
Matrix: Water
Analysis Batch: 659084

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Fluoride	<0.10		0.10		mg/L			05/27/22 19:53	1

Lab Sample ID: LCS 500-659084/4
Matrix: Water
Analysis Batch: 659084

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Fluoride	10.0	10.2		mg/L		102	90 - 119

Lab Sample ID: 500-217043-1 MS
Matrix: Water
Analysis Batch: 659084

Client Sample ID: MW-01
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits
Fluoride	0.21		5.00	5.28		mg/L		101	75 - 125

Lab Sample ID: 500-217043-1 MSD
Matrix: Water
Analysis Batch: 659084

Client Sample ID: MW-01
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Fluoride	0.21		5.00	5.28		mg/L		101	75 - 125	0	20

Method: SM 4500 NO2 B - Nitrogen, Nitrite

Lab Sample ID: MB 500-658340/9
Matrix: Water
Analysis Batch: 658340

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Nitrogen, Nitrite	<0.020		0.020		mg/L			05/24/22 17:27	1

Lab Sample ID: LCS 500-658340/10
Matrix: Water
Analysis Batch: 658340

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Nitrogen, Nitrite	0.100	0.0977		mg/L		98	90 - 113

Lab Sample ID: 500-217043-1 MS
Matrix: Water
Analysis Batch: 658340

Client Sample ID: MW-01
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits
Nitrogen, Nitrite	<0.020		0.100	0.0949		mg/L		95	75 - 125

QC Sample Results

Client: KPRG and Associates, Inc.
Project/Site: Waukegan Station Permit

Job ID: 500-217043-1

Method: SM 4500 NO2 B - Nitrogen, Nitrite (Continued)

Lab Sample ID: 500-217043-1 MSD
Matrix: Water
Analysis Batch: 658340

Client Sample ID: MW-01
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Nitrogen, Nitrite	<0.020		0.100	0.0947		mg/L		95	75 - 125	0	20

Lab Sample ID: MB 500-658504/9
Matrix: Water
Analysis Batch: 658504

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Nitrogen, Nitrite	<0.020		0.020		mg/L			05/25/22 12:56	1

Lab Sample ID: LCS 500-658504/10
Matrix: Water
Analysis Batch: 658504

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Nitrogen, Nitrite	0.100	0.101		mg/L		101	90 - 113

Method: SM 4500 NO3 F - Nitrogen, Nitrate

Lab Sample ID: MB 500-658789/49
Matrix: Water
Analysis Batch: 658789

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Nitrogen, Nitrate Nitrite	<0.10		0.10		mg/L			05/26/22 15:16	1

Lab Sample ID: LCS 500-658789/50
Matrix: Water
Analysis Batch: 658789

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Nitrogen, Nitrate Nitrite	1.00	0.992		mg/L		99	80 - 120

Lab Sample ID: 500-217043-1 MS
Matrix: Water
Analysis Batch: 658789

Client Sample ID: MW-01
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits
Nitrogen, Nitrate Nitrite	<0.10		1.00	1.07		mg/L		107	75 - 125

Lab Sample ID: 500-217043-1 MSD
Matrix: Water
Analysis Batch: 658789

Client Sample ID: MW-01
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Nitrogen, Nitrate Nitrite	<0.10		1.00	1.10		mg/L		110	75 - 125	3	20

Eurofins TestAmerica, Chicago
2417 Bond Street
University Park IL 60484
Phone (708) 534-5200 Phone (708) 534-5211

Chain of Custody Record

eurofins | Environment Testing America

Client Information	Sampler: Mitchel Dolan + Kaelyn Sperle	Lab PM: Mockler Diana J	Carrier Tracking No(s):	COC No: 500-96049-42473 1
Client Contact: Mitchel Dolan	Phone: 262-622-1143	E-Mail: Diana.Mockler@Eurofinset.com	State of Origin: IL	Page: Page 1 of 1
Company: KPRG and Associates Inc	PWSID:			Job #: 500-217043
Address: 14665 West Lisbon Road Suite 1A	Due Date Requested:			
City: Brookfield	TAT Requested (days):			
State, Zip: WI 53005	Compliance Project: Δ Yes Δ No			
Phone: 262 781-0475(Tel)	PO #: 4502012555			
Email: mitcheld@kprginc com	WO #:			
Project Name: Waukegan Station Permit	Project #: 50004763			
Site: Illinois	SSOW#:			

Analysis Requested

Preservation Codes

A	HCL	M	Hexane
B	NaOH	N	None
C	Zn Acetate	O	AsNaO2
D	Nitric Acid	P	Na2O4S
E	NaHSO4	Q	Na2SO3
F	MeOH	R	Na2S2O3
G	Amchlor	S	H2SO4
H	Ascorbic Acid	T	TSP Dodecahydrate
I	Ice	U	Acetone
J	DI Water	V	MCAA
K	EDTA	W	pH 4-5
L	EDA	Z	other (specify)

Other:

500-217043 COC

	Sample Identification	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	903.0 904.0	6020A, 7470A	Nitrate_Calc, SM4500_NO3_F	2540C 4500_F_C 9038 9251, SM4500_NO2_B	9014 - Cyanide, Total	Total Number of containers	Special Instructions/Note:
				Preservation Code				D	D	S	N	B		
1	MW-01	5/23/22	1059	G	W	N	N	X	X	X	X	X		Short Hold-NO_2 (48 HR)
2	MW-02	5/23/22	1153	G	W	N	N	↓	↓	↓	↓	↓		↓
3	MW-03	5/23/22	1245	G	W	N	N							
4	MW-04	5/23/22	1357	G	W	N	N							
5	Duplicate	5/23/22	—	G	W	N	N							

Possible Hazard Identification
☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐ Radiological

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return To Client ☐ Disposal By Lab ☐ Archive For _____ Months

Deliverable Requested I II III IV Other (specify)

Special Instructions/QC Requirements

Empty Kit Relinquished by	Date	Time	Method of Shipment

	Relinquished by	Date/Time	Company	Received by	Date/Time	Company
1	MPD	5/23/22 / 1700	KPRG	FEDEX	5/23/22 / 1700	FEDEX
2		Date/Time	Company	Received by: Stephanie Hernandez	Date/Time 5/24/22 0815	Company EEIA
3		Date/Time	Company	Received by	Date/Time	Company

Custody Seals Intact. Δ Yes Δ No	Custody Seal No	Cooler Temperature(s) °C and Other Remarks	10+0 5, 8 1+1.4

Ver 01/16/2019

6/8/2022

Electronic Filing: Received, Clerk's Office 10/31/2022

Eurofins TestAmerica, Chicago
2417 Bond Street
University Park IL 60484
Phone (708) 534 5200 Phone (708) 534-5211

Chain of Custody Record

eurofins | environment testing Americ

Client Information	Sampler: Kaelyn Sparks & Mitchel Dolan	Lab PM: Mockler Diana J	Carrier Tracking No(s):	COC No: 500-96049-42473 1
Client Contact: Mitchel Dolan	Phone: 262-781-0475	E-Mail: Diana Mockler@Eurofinset com	State of Origin: IL	Page: Page 1 of 1
Company: KPRG and Associates Inc	PWSID:	Analysis Requested		Job #: 500-217043
Address: 14665 West Lisbon Road Suite 1A	Due Date Requested:			Preservation Codes: A HCL, B NaOH, C Zn Acetate, D Nitric Acid, E NaHSO4, F MeOH, G Amchlor, H Ascorbic Acid, I Ice, J DI Water, K EDTA, L EDA, M Hexane, N None, O AsNaO2, P Na2O4S, Q Na2SO3, R Na2S2O3, S H2SO4, T TSP Dodecahydrate, U Acetone, V MCAA, W pH 4-5, Z other (specify)
City: Brookfield	TAT Requested (days):			
State, Zip: WI 53005	Compliance Project: Δ Yes Δ No			
Phone: 262 781-0475(Tel)	PO #: 4502012555			
Email: mitcheld@kprginc com	WO #:			
Project Name: Waukegan Station Permit	Project #: 50004763			
Site: Illinois	SSOW#:			Other:

	Sample Identification	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	903.0 904.0	6020A, 7470A	Nitrate_Calc, SM4500_NO3_F	2540C 4500_F_C, 9038 9251 SM4500_NO2_B	9014 - Cyanide Total	Total Number of containers	Special Instructions/Note.
				Preservation Code				D	D	S	N	B		
6	MW-05	5/24/22	1211	G	W	N	N	X	X	X	X	X		
7	MW-06	5/24/22	1340	G	W	N	N	↓	↓	↓	↓	↓		
8	MW-07	5/24/22	1301	G	W	N	N	↓	↓	↓	↓	↓		

500-217043 COC

Possible Hazard Identification
☐ Non Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐ Radiological

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return To Client ☐ Disposal By Lab ☐ Archive For _____ Months

Deliverable Requested I II III IV Other (specify)

Special Instructions/QC Requirements

Empty Kit Relinquished by	Date	Time	Method of Shipment

	Relinquished by	Date/Time	Company	Received by	Date/Time	Company
1	Kaelyn Sparks	5/24/22 1700	KPRG	FedEx	5/24/22 1700	FedEx
2	Relinquished by	Date/Time	Company	Received by: Stephanie Hernandez	Date/Time 5/25/22 0940	Company EEA
3	Relinquished by	Date/Time	Company	Received by	Date/Time	Company

Custody Seals Intact: Δ Yes Δ No	Custody Seal No	Cooler Temperature(s) °C and Other Remarks: 1 6+1 1

Ver: 01/16/2019

6/8/2022

Electronic Filing: Received, Clerk's Office 10/31/2022

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2417 Bond Street
University Park IL 60484
Phone (708) 534-5200 Phone (708) 534-5211

Chain of Custody Record

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Client Information	Sampler: Kaitlyn Sperle & Mitchel Dolan	Lab PM: Mockler Diana J	Carrier Tracking No(s):	COC No: 500-96049-42473 1
Client Contact: Mitchel Dolan	Phone: 262-781-0475	E-Mail: Diana.Mockler@Eurofinset.com	State of Origin: IL	Page: Page 1 of 1
Company: KPRG and Associates Inc	PWSID:	Analysis Requested		Job #: 500 217043
Address: 14665 West Lisbon Road Suite 1A	Due Date Requested:			Preservation Codes: A HCL, B NaOH, C Zn Acetate, D Nitric Acid, E NaHSO4, F MeOH, G Amchlor, H Ascorbic Acid, I Ice, J DI Water, K EDTA, L EDA, M Hexane, N None, O AsNaO2, P Na2O4S, Q Na2SO3, R Na2S2O3, S H2SO4, T TSP Dodecahydrate, U Acetone, V MCAA, W pH 4-5, Z other (specify); Other
City: Brookfield	TAT Requested (days):			
State, Zip: WI 53005	Compliance Project: Δ Yes Δ No			
Phone: 262 781-0475(Tel)	PO #: 4502012555			
Email: mitcheld@kprginc com	WO #:			
Project Name: Waukegan Station Permit	Project #: 50004763			
Site: Illinois	SSOW#:			

Sample Identification	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water S=solid O=waste/oil, BT=Tissue A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	903.0 904.0	6020A, 7470A	Nitrate_Calc SM4500_NO3_F	2540C 4500_F_C, 9038 9251, SM4500_NO2_B	9014 - Cyanide, Total												Total Number of containers	Special Instructions/Note.
			Preservation Code				D	D	S	N	B													
9 MW-08	5/24/22	1428	G	W	N	N	X	X	X	X	X													
10 MW-09	5/24/22	1110	G	W	N	N	↓	↓	↓	↓	↓													

Possible Hazard Identification
☐ Non Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐ Radiological

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return To Client ☐ Disposal By Lab ☐ Archive For _____ Months

Deliverable Requested I II III IV Other (specify)

Special Instructions/QC Requirements

Empty Kit Relinquished by	Date	Time	Method of Shipment

Relinquished by	Date/Time	Company	Received by	Date/Time	Company
Kaitlyn Sperle	5/24/22 1700	KPRG	FedEx	5/24/22 1700	FedEx
Relinquished by	Date/Time	Company	Received by: Stephanie Hernandez	Date/Time 5/25/22 0940	Company EEIA
Relinquished by	Date/Time	Company	Received by	Date/Time	Company

Custody Seals Intact Δ Yes Δ No	Custody Seal No	Cooler Temperature(s) °C and Other Remarks
		11+0.6

Electronic Filing: Received, Clerk's Office 10/31/2022

Eurofins TestAmerica, Chicago
2417 Bond Street
University Park IL 60484
Phone (708) 534-5200 Phone (708) 534-5211

Chain of Custody Record

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Client Information	Sampler: Kaelyn Sperle & Mitchel Dolan	Lab PM: Mockler Diana J	Carrier Tracking No(s):	COC No: 500-96049-42473 1
Client Contact: Mitchel Dolan	Phone: 262-781-0475	E Mail: Diana.Mockler@Eurofinset.com	State of Origin: IL	Page: Page 1 of 1
Company: KPRG and Associates Inc	PWSID:			Job #: 500-217043
Address: 14665 West Lisbon Road Suite 1A	Due Date Requested:			
City: Brookfield	TAT Requested (days):			
State, Zip: WI 53005	Compliance Project: Δ Yes Δ No			
Phone: 262 781-0475(Tel)	PO #: 4502012555			
Email: mitcheld@kprginc.com	WO #:			
Project Name: Waukegan Station Permit	Project #: 50004763			
Site: Illinois	SSOW#:			

Analysis Requested

Preservation Codes:
A HCL, B NaOH, C Zn Acetate, D Nitric Acid, E NaHSO4, F MeOH, G Amchlor, H Ascorbic Acid, I Ice, J DI Water, K EDTA, L EDA, M Hexane, N None, O AsNaO2, P Na2O4S, Q Na2SO3, R Na2S2O3, S H2SO4, T TSP Dodecahydrate, U Acetone, V MCAA, W pH 4-5, Z other (specify)
Other:

	Sample Identification	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (Wewater, Sesolid, Owwaste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	903.0 904.0	6020A, 7470A	Nitrate_Calc, SM4500_NO3_F	2540C, 4500_F_C 9038 9251 SM4500_NO2_B	9014 - Cyanide Total	Total Number of containers	Special Instructions/Note:
				Preservation Code				D	D	S	N	B		
11	MW-11 ELUC	5/24/22	0910	G	W	N	N	X	X	X	X	X		
12	MW-14 ELUC	5/24/22	1008	G	W	N	N	↓	↓	↓	↓	↓		
13	MW-15 ELUC	5/24/22	~~0915~~ 0915	G	W	N	N	↓	↓	↓	↓	↓		

Possible Hazard Identification: ☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐ Radiological

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): ☐ Return To Client ☐ Disposal By Lab ☐ Archive For _____ Months

Deliverable Requested I II III IV Other (specify)

Special Instructions/QC Requirements

Empty Kit Relinquished by	Date	Time	Method of Shipment

	Relinquished by	Date/Time	Company	Received by	Date/Time	Company
1	Kaelyn Sperle	5/24/22 / 1700	KPRG	FedEx	5/24/22 / 1700	FedEx
2	Relinquished by	Date/Time	Company	Received by: Stephanie Hernandez	Date/Time 5/25/22 0940	Company EEIA
3	Relinquished by	Date/Time	Company	Received by	Date/Time	Company

Custody Seals Intact: Δ Yes Δ No	Custody Seal No	Cooler Temperature(s) °C and Other Remarks: 2.4+1.0

Electronic Filing: Received, Clerk's Office 10/31/2022

Eurofins TestAmerica, Chicago
2417 Bond Street
University Park IL 60484
Phone (708) 534-5200 Phone (708) 534-5211

Chain of Custody Record

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Client Information	Sampler: Kaelyn Spurk & Mitchel Dolan	Lab PM: Mockler Diana J	Carrier Tracking No(s):	COC No: 500-96049-42473 1
Client Contact: Mitchel Dolan	Phone: 262-781-0475	E-Mail: Diana Mockler@Eurofinset com	State of Origin: IL	Page: Page 1 of 1
Company: KPRG and Associates Inc	PWSID:	Analysis Requested		Job #: 500-217043
Address: 14665 West Lisbon Road Suite 1A	Due Date Requested:			Preservation Codes: A HCL, B NaOH, C Zn Acetate, D Nitric Acid, E NaHSO4, F MeOH, G Amchlor, H Ascorbic Acid, I Ice, J DI Water, K EDTA, L EDA, M Hexane, N None, O AsNaO2, P Na2O4S, Q Na2SO3, R Na2S2O3, S H2SO4, T TSP Dodecahydrate, U Acetone, V MCAA, W pH 4-5, Z other (specify); Other:
City: Brookfield	TAT Requested (days):			
State, Zip: WI 53005	Compliance Project: Δ Yes Δ No			
Phone: 262 781-0475(Tel)	PO #: 4502012555			
Email: mitchell@kprginc com	WO #:			
Project Name: Waukegan Station Permit	Project #: 50004763			
Site: Illinois	SSOW#:			

	Sample Identification	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water S=solid O=waste/oil BT=Tissue A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	903 0, 904.0	6020A, 7470A	Nitrate_Calc, SM4500_NO3_F	2540C, 4500_F_C, 9038 9251, SM4500_NO2_B	9014 - Cyanide, Total	Total Number of containers	Special Instructions/Note.
				Preservation Code				D	D	S	N	B		
14	MW-10 ELUC	5/25/22	0922	G	W	N	N	X	X	X	X	X		
15	MW-12 ELUC	5/25/22	1003	G	W	N	N	↓	↓	↓	↓	↓		

500-217043 COC

Possible Hazard Identification
☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐ Radiological

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return To Client ☐ Disposal By Lab ☐ Archive For _____ Months

Deliverable Requested I II III IV Other (specify)

Special Instructions/QC Requirements

Empty Kit Relinquished by	Date	Time	Method of Shipment

	Relinquished by	Date/Time	Company	Received by	Date/Time	Company
1	Kaelyn Spurk	5/25/22 / 1200	KPRG	FedEx	5/25/22 / 1200	FedEx
2				Stephanie Hemendinger	5/26/22 0925	EFTA
3						

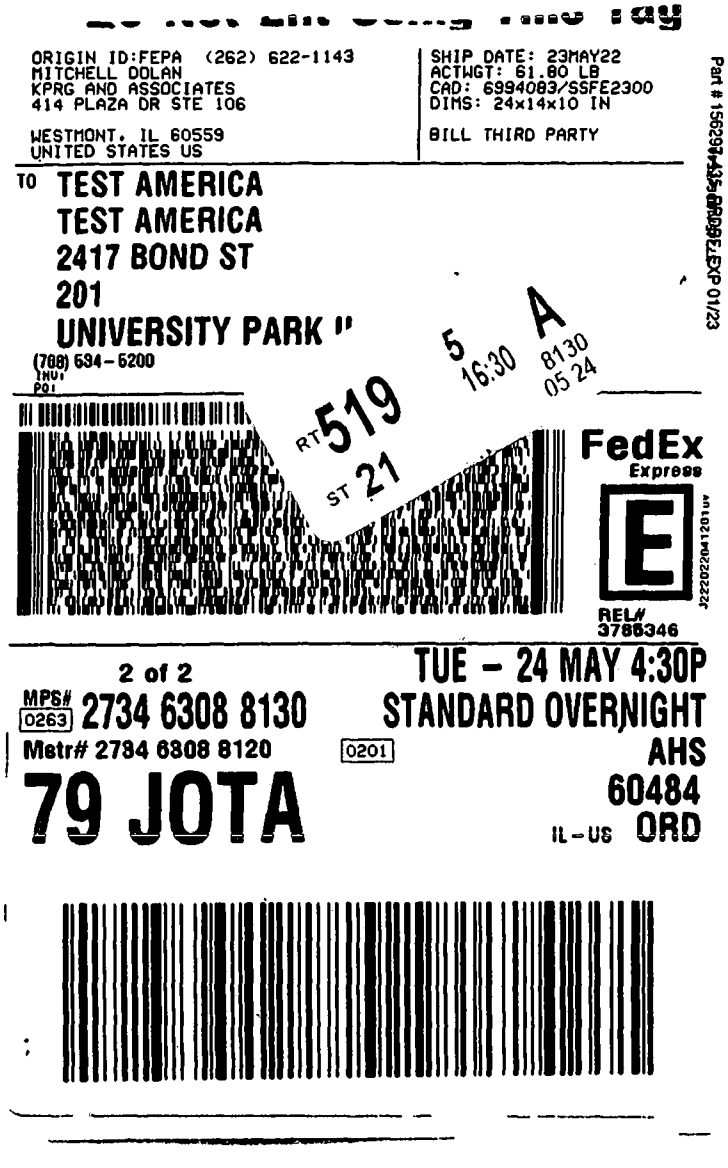
Custody Seals Intact: Δ Yes Δ No | Custody Seal No:

Cooler Temperature(s) °C and Other Remarks: 1.5+1.0

Ver 01/16/2019

6/8/2022

Electronic Filing: Received, Clerk's Office 10/31/2022



ORIGIN ID:FEPA (262) 622-1143
MITCHELL DOLAN
KPRG AND ASSOCIATES
414 PLAZA DR STE 106

WESTMONT, IL 60559
UNITED STATES US

SHIP DATE: 23MAY22
ACTWGT: 61.80 LB
CAD: 6994083/SSFE2300
DIMS: 24x14x10 IN

BILL THIRD PARTY

Part # 156293435-000DEC EXP 01/23

TO TEST AMERICA
TEST AMERICA
2417 BOND ST
201
UNIVERSITY PARK "
(708) 534-6200

INV:
PO:

RT 519
ST 21
5 16:30 A
8130
05 24

FedEx Express

REL# 3786346

2 of 2
MPS# 0263 2734 6308 8130
Mstr# 2734 6308 8120

0201

TUE - 24 MAY 4:30P
STANDARD OVERNIGHT
AHS
60484
IL-US ORD

79 JOTA

ORIGIN ID:FEPA (262) 622-1143
MITCHELL DOLAN
KPRG AND ASSOCIATES
414 PLAZA DR STE 106

WESTMONT, IL 60559
UNITED STATES US

SHIP DATE: 23MAY22
ACTWGT: 61.80 LB
CAD: 6994083/SSFE2300
DIMS: 24x14x10 IN

BILL THIRD PARTY

Part # 156293435

TO TEST AMERICA
TEST AMERICA
2417 BOND ST
201
UNIVERSITY PARK IL 60484
(708) 534-6200

INV:
PO:
REF:
DEPT:

500-217043 Waybl

FedEx Express

REL# 3786346

1 of 2
TRK# 0201 2734 6308 8120
MASTER

TUE - 24 MAY 4:30P
STANDARD OVERNIGHT
AHS
60484
IL-US ORD

79 JOTA

Electronic Filing: Received, Clerk's Office 10/31/2022

ORIGIN ID:FEPA (262) 622-1143
MITCHELL DOLAN
KPRG AND ASSOCIATES
414 PLAZA DR STE 106

WESTMONT, IL 60559
UNITED STATES US

SHIP DATE: 24MAY22
ACTWGT: 56.30 LB
CAD: 6994083/SSFE2300
DIMS: 24x13x13 IN

BILL THIRD PARTY

Part # 156297-435 RRDBF EXP 01/23

TO TEST AMERICA
TEST AMERICA
2417 BOND ST
201
UNIVERSITY PARK IL 60484
(708) 634-6200 REF:
INV:
PO: DEPT:

FedEx Express

REL# 3785346

2 of 3
MPS# 0263 2735 1248 8898
Mstr# 2735 1248 8887

WED - 25 MAY 4:30P
STANDARD OVERNIGHT
0201
AHS
60484
IL-US ORD

79 JOTA

ORIGIN ID:FEPA (262) 622-1143
MITCHELL DOLAN
KPRG AND ASSOCIATES
414 PLAZA DR STE 106

WESTMONT, IL 60559
UNITED STATES US

SHIP DATE: 24MAY22
ACTWGT: 56.30 LB
CAD: 6994083/SSFE2300
DIMS: 24x13x13 IN

BILL THIRD PARTY

Part # 156297-435 RRDBF EXP 01/23

TO TEST AMERICA
TEST AMERICA
2417 BOND ST
201
UNIVERSITY PARK IL 60484
(708) 634-6200 REF:
INV:
PO: DEPT:

500-217043 Waybi

FedEx Express

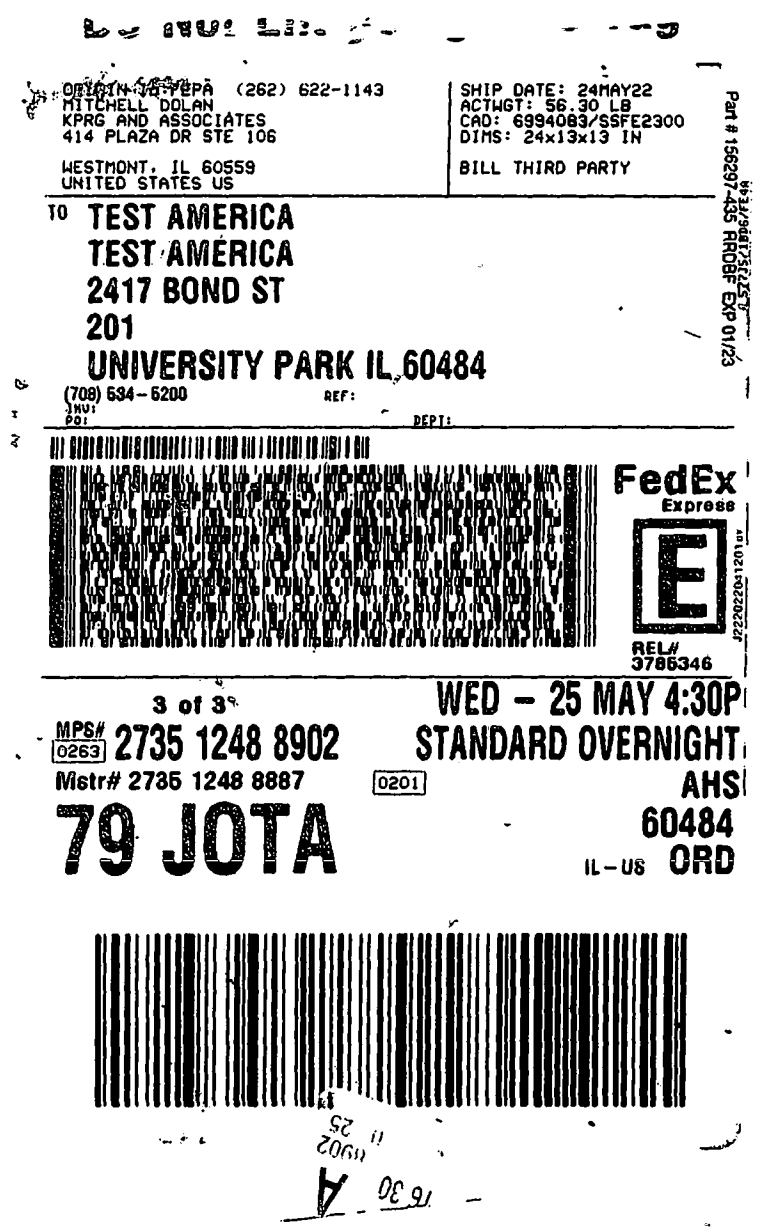
REL# 3785346

1 of 3
TRK# 0201 2735 1248 8[illegible]
MASTER

[illegible] - 25 MAY 4:30P
[illegible]RNIGHT
AHS
60484
US ORD

79 JOTA

Electronic Filing: Received, Clerk's Office 10/31/2022



ORIGIN ID:PEPA (262) 622-1143
MITCHELL DOLAN
KPRG AND ASSOCIATES
414 PLAZA DR STE 106

WESTMONT, IL 60559
UNITED STATES US

SHIP DATE: 24MAY22
ACTWGT: 56.30 LB
CAD: 6994083/SSFE2300
DIMS: 24x13x13 IN

BILL THIRD PARTY

Part # 156297-435 ARGBF EXP 01/23

TO TEST AMERICA
TEST AMERICA
2417 BOND ST
201
UNIVERSITY PARK IL 60484
(708) 534-5200 REF:
INV:
PO: DEPT:

FedEx Express

REL# 3786346

3 of 3

WED - 25 MAY 4:30P
STANDARD OVERNIGHT

MPS# 0263 2735 1248 8902
Mstr# 2735 1248 8887

0201

AHS
60484
IL-US ORD

79 JOTA

Electronic Filing: Received, Clerk's Office 10/31/2022

500-217043 Waybi

ORIGIN ID:FEPA (630) 325-1300

KPRG AND ASSOCIATES
414 PLAZA DR STE 106

WESTMONT, IL 60559
UNITED STATES US

SHIP DATE: 25MAY22
ACTWGT: 50.40 LB
CAD: 6994084/SSFE2300
DIMS: 23x13x[illegible]N

BILL THIRD PARTY

Part # 156727-[illegible] REF 01/23

10 TEST AMERICA
C/O SAMPLE & RECEIVING
2417 BOND ST
SUITE 201
UNIVERSITY PARK IL 60484

(708) 534-6200 REF:
INV:
PO: DEPT:

FedEx Express

REL# 3785346

THU - 26 MAY 10:30A
PRIORITY OVERNIGHT

TRK# 0201 2735 4029 3700

79 JOTA

60484
IL-US ORD

Electronic Filing: Received, Clerk's Office 10/31/2022

Eurofins Chicago
2417 Bond Street
University Park, IL 60484
Phone: 708-534-5200 Fax: 708-534-5211

Chain of Custody Record

eurofins | Environment Testing America

Client Information (Sub Contract Lab)	Sampler:	Lab PM: Mockler, Diana J	Carrier Tracking No(s):	COC No: 500-161064.1
Client Contact: Shipping/Receiving	Phone:	E-Mail: Diana.Mockler@et.eurofinsus.com	State of Origin: Illinois	Page: Page 1 of 1
Company: TestAmerica Laboratories, Inc.		Accreditations Required (See note): NELAP - Illinois		Job #: 500-217043-2
Address: 13715 Rider Trail North,	Due Date Requested: 6/7/2022			
City: Earth City	TAT Requested (days):			
State, Zip: MO, 63045				
Phone: 314-298-8566(Tel) 314-298-8757(Fax)	PO #:			
Email:	WO #:			
Project Name: Waukegan Station Permit	Project #: 50004763			
Site: NRG Midwest Generation Waukegan	SSOW#:			

Analysis Requested

Preservation Codes:
A - HCL, B - NaOH, C - Zn Acetate, D - Nitric Acid, E - NaHSO4, F - MeOH, G - Amchlor, H - Ascorbic Acid, I - Ice, J - DI Water, K - EDTA, L - EDA, M - Hexane, N - None, O - AsNaO2, P - Na2O4S, Q - Na2SO3, R - Na2S2O3, S - H2SO4, T - TSP Dodecahydrate, U - Acetone, V - MCAA, W - pH 4-5, Y - Trizma, Z - other (specify)
Other:

Sample Identification - Client ID (Lab ID)	Sample Date	Sample Time	Sample Type (C=Comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	903.0/PrecSep_21 Standard Target List	904.0/PrecSep_0 Standard Target List	Total Number of containers	Special Instructions/Note:
			Preservation Code:							
MW-01 (500-217043-1)	5/23/22	10:59 Central		Water			X	X	3	Batch QC must be performed (dup, spikes, etc) - no NCMs concerning limited volume;
MW-02 (500-217043-2)	5/23/22	11:53 Central		Water			X	X	3	Batch QC must be performed (dup, spikes, etc) - no NCMs concerning limited volume;
MW-03 (500-217043-3)	5/23/22	12:45 Central		Water			X	X	3	Batch QC must be performed (dup, spikes, etc) - no NCMs concerning limited volume;
MW-04 (500-217043-4)	5/23/22	13:57 Central		Water			X	X	3	Batch QC must be performed (dup, spikes, etc) - no NCMs concerning limited volume;
Duplicate (500-217043-5)	5/23/22	Central		Water			X	X	3	Batch QC must be performed (dup, spikes, etc) - no NCMs concerning limited volume;

Note: Since laboratory accreditations are subject to change, Eurofins Chicago places the ownership of method, analyte & accreditation compliance upon out subcontract laboratories. This sample shipment is forwarded under chain-of-custody. If the laboratory does not currently maintain accreditation in the State of Origin listed above for analysis/tests/matrix being analyzed, the samples must be shipped back to the Eurofins Chicago laboratory or other instructions will be provided. Any changes to accreditation status should be brought to Eurofins Chicago attention immediately. If all requested accreditations are current to date, return the signed Chain of Custody attesting to said complicance to Eurofins Chicago.

Possible Hazard Identification *Unconfirmed*	***Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)*** ☐ Return To Client ☐ Disposal By Lab ☐ Archive For ____ Months
Deliverable Requested: I, II, III, IV, Other (specify) Primary Deliverable Rank: 2	Special Instructions/QC Requirements:

Empty Kit Relinquished by:		Date:		Time:		Method of Shipment:	
Relinquished by:	Date/Time: 5/24/22 1121	Company	Received by: FED EX	Date/Time:	Company		
Relinquished by: FED EX	Date/Time:	Company	Received by:	Date/Time: MAY 25 2022 0900	Company		
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company		

Custody Seals Intact: △ Yes △ No	Custody Seal No.:
Cooler Temperature(s) °C and Other Remarks:	

Page 33 of 48

6/8/2022

Electronic Filing: Received, Clerk's Office 10/31/2022

Eurofins Chicago
2417 Bond Street
University Park, IL 60484
Phone: 708-534-5200 Fax: 708-534-5211

Chain of Custody Record

eurofins | Environment Testing America

Client Information (Sub Contract Lab)	Sampler:	Lab PM: Mockler, Diana J	Carrier Tracking No(s):	COC No: 500-161170.1
Client Contact: Shipping/Receiving	Phone:	E-Mail: Diana.Mockler@et.eurofinsus.com	State of Origin: Illinois	Page: Page 1 of 1
Company: TestAmerica Laboratories, Inc.		Accreditations Required (See note): NELAP - Illinois		Job #: 500-217043-1
Address: 13715 Rider Trail North,	Due Date Requested: 6/7/2022			
City: Earth City	TAT Requested (days):			
State, Zip: MO, 63045				
Phone: 314-298-8566(Tel) 314-298-8757(Fax)	PO #:			
Email:	WO #:			
Project Name: Waukegan Station Permit	Project #: 50004763			
Site: NRG Midwest Generation Waukegan	SSOW#:			

Preservation Codes:
A - HCL, B - NaOH, C - Zn Acetate, D - Nitric Acid, E - NaHSO4, F - MeOH, G - Amchlor, H - Ascorbic Acid, I - Ice, J - DI Water, K - EDTA, L - EDA, M - Hexane, N - None, O - AsNaO2, P - Na2O4S, Q - Na2SO3, R - Na2S2O3, S - H2SO4, T - TSP Dodecahydrate, U - Acetone, V - MCAA, W - pH 4-5, Y - Trizma, Z - other (specify), Other:

Analysis Requested

Sample Identification - Client ID (Lab ID)	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	903.0/PrecSep_21 Standard Target List	904.0/PrecSep_0 Standard Target List	Total Number of containers	Special Instructions/Note:
			Preservation Code:							
MW-05 (500-217043-6)	5/24/22	12:11 Central		Water			X	X	3	Batch QC must be performed (dup, spikes, etc) - no NCMs concerning limited volume;
MW-06 (500-217043-7)	5/24/22	13:40 Central		Water			X	X	3	Batch QC must be performed (dup, spikes, etc) - no NCMs concerning limited volume;
MW-07 (500-217043-8)	5/24/22	13:01 Central		Water			X	X	3	Batch QC must be performed (dup, spikes, etc) - no NCMs concerning limited volume;

Note: Since laboratory accreditations are subject to change, Eurofins Chicago places the ownership of method, analyte & accreditation compliance upon out subcontract laboratories. This sample shipment is forwarded under chain-of-custody. If the laboratory does not currently maintain accreditation in the State of Origin listed above for analysis/tests/matrix being analyzed, the samples must be shipped back to the Eurofins Chicago laboratory or other instructions will be provided. Any changes to accreditation status should be brought to Eurofins Chicago attention immediately. If all requested accreditations are current to date, return the signed Chain of Custody attesting to said complicance to Eurofins Chicago.

Possible Hazard Identification	*Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)*
Unconfirmed	☐ *Return To Client* ☐ *Disposal By Lab* ☐ *Archive For* ____ *Months*
Deliverable Requested: I, II, III, IV, Other (specify) Primary Deliverable Rank: 2	Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:

	Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
1	Rhiannon Scott	5/25/22 1630	ETAS	FED EX		
2	FED EX			Sierra Worthington	MAY 26 2022 0900	ETAS
3						

Custody Seals Intact: Δ Yes Δ No	Custody Seal No.:	Cooler Temperature(s) °C and Other Remarks:

Electronic Filing: Received, Clerk's Office 10/31/2022

Eurofins Chicago
2417 Bond Street
University Park, IL 60484
Phone: 708-534-5200 Fax: 708-534-5211

Chain of Custody Record

eurofins Environment Testing America

Client Information (Sub Contract Lab)	Sampler:	Lab PM: Mockler, Diana J	Carrier Tracking No(s):	COC No: 500-161170.1
Client Contact: Shipping/Receiving	Phone:	E-Mail: Diana.Mockler@et.eurofinsus.com	State of Origin: Illinois	Page: Page 1 of 1
Company: TestAmerica Laboratories, Inc.		Accreditations Required (See note): NELAP - Illinois		Job #: 500-217043-5
Address: 13715 Rider Trail North, .	Due Date Requested: 6/28/2022			
City: Earth City	TAT Requested (days):			
State, Zip: MO, 63045				
Phone: 314-298-8566(Tel) 314-298-8757(Fax)	PO #:			
Email:	WO #:			
Project Name: Waukegan Station Permit	Project #: 50004763			
Site: NRG Midwest Generation Waukegan	SSOW#:			

Analysis Requested

Preservation Codes:
A - HCL, B - NaOH, C - Zn Acetate, D - Nitric Acid, E - NaHSO4, F - MeOH, G - Amchlor, H - Ascorbic Acid, I - Ice, J - DI Water, K - EDTA, L - EDA, M - Hexane, N - None, O - AsNaO2, P - Na2O4S, Q - Na2SO3, R - Na2S2O3, S - H2SO4, T - TSP Dodecahydrate, U - Acetone, V - MCAA, W - pH 4-5, Y - Trizma, Z - other (specify), Other:

Sample Identification - Client ID (Lab ID)	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	903.0/PrecSep_21 Standard Target List	904.0/PrecSep_0 Standard Target List	Total Number of containers	Special Instructions/Note:
			Preservation Code:							
MW-08 (500-217043-9)	5/24/22	14:28 Central		Water			X	X	3	Batch QC must be performed (dup, spikes, etc) - no NCMs concerning limited volume;
MW-09 (500-217043-10)	5/24/22	11:10 Central		Water			X	X	3	Batch QC must be performed (dup, spikes, etc) - no NCMs concerning limited volume;

Note: Since laboratory accreditations are subject to change, Eurofins Chicago places the ownership of method, analyte & accreditation compliance upon out subcontract laboratories. This sample shipment is forwarded under chain-of-custody. If the laboratory does not currently maintain accreditation in the State of Origin listed above for analysis/tests/matrix being analyzed, the samples must be shipped back to the Eurofins Chicago laboratory or other instructions will be provided. Any changes to accreditation status should be brought to Eurofins Chicago attention immediately. If all requested accreditations are current to date, return the signed Chain of Custody attesting to said complicance to Eurofins Chicago.

Possible Hazard Identification	*Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)*
Unconfirmed	☐ *Return To Client* ☐ *Disposal By Lab* ☐ *Archive For* ____ *Months*
Deliverable Requested: I, II, III, IV, Other (specify) Primary Deliverable Rank: 2	Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:

	Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
1	[signature]	5/25/22 1430	EETA	FED EX		
2	Relinquished by: FED EX	Date/Time:	Company	Received by: Dena Worthington	Date/Time: MAY 26 2022 0900	Company CHI3R
3	Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company

Custody Seals Intact: Δ Yes Δ No	Custody Seal No.:	Cooler Temperature(s) °C and Other Remarks:

6/8/2022

Electronic Filing: Received, Clerk's Office 10/31/2022

Eurofins Chicago
2417 Bond Street
University Park, IL 60484
Phone: 708-534-5200 Fax: 708-534-5211

Chain of Custody Record

eurofins | Environment Testing America

Client Information (Sub Contract Lab)	Sampler:	Lab PM: Mockler, Diana J	Carrier Tracking No(s):	COC No: 500-161170.1
Client Contact: Shipping/Receiving	Phone:	E-Mail: Diana.Mockler@et.eurofinsus.com	State of Origin: Illinois	Page: Page 1 of 1
Company: TestAmerica Laboratories, Inc.		Accreditations Required (See note): NELAP - Illinois		Job #: 500-217043-6
Address: 13715 Rider Trail North, .	Due Date Requested: 6/7/2022			
City: Earth City	TAT Requested (days):			
State, Zip: MO, 63045				
Phone: 314-298-8566(Tel) 314-298-8757(Fax)	PO #:			
Email:	WO #:			
Project Name: Waukegan Station Permit	Project #: 50004763			
Site: NRG Midwest Generation Waukegan	SSOW#:			

Analysis Requested

Preservation Codes:
A - HCL, B - NaOH, C - Zn Acetate, D - Nitric Acid, E - NaHSO4, F - MeOH, G - Amchlor, H - Ascorbic Acid, I - Ice, J - DI Water, K - EDTA, L - EDA, M - Hexane, N - None, O - AsNaO2, P - Na2O4S, Q - Na2SO3, R - Na2S2O3, S - H2SO4, T - TSP Dodecahydrate, U - Acetone, V - MCAA, W - pH 4-5, Y - Trizma, Z - other (specify), Other:

Sample Identification - Client ID (Lab ID)	Sample Date	Sample Time	Sample Type (C=Comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	903.0/PrecSep_21 Standard Target List	904.0/PrecSep_0 Standard Target List	Total Number of containers	Special Instructions/Note:
			Preservation Code:							
ELUC MW-11 (500-217043-11)	5/24/22	09:10 Central		Water			X	X	3	Batch QC must be performed (dup, spikes, etc) - no NCMs concerning limited volume;
ELUC MW-14 (500-217043-12)	5/24/22	10:08 Central		Water			X	X	3	Batch QC must be performed (dup, spikes, etc) - no NCMs concerning limited volume;
ELUC MW-15 (500-217043-13)	5/24/22	15:12 Central		Water			X	X	3	Batch QC must be performed (dup, spikes, etc) - no NCMs concerning limited volume;

Note: Since laboratory accreditations are subject to change, Eurofins Chicago places the ownership of method, analyte & accreditation compliance upon out subcontract laboratories. This sample shipment is forwarded under chain-of-custody. If the laboratory does not currently maintain accreditation in the State of Origin listed above for analysis/tests/matrix being analyzed, the samples must be shipped back to the Eurofins Chicago laboratory or other instructions will be provided. Any changes to accreditation status should be brought to Eurofins Chicago attention immediately. If all requested accreditations are current to date, return the signed Chain of Custody attesting to said complicance to Eurofins Chicago.

Possible Hazard Identification	*Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)*
Unconfirmed	☐ *Return To Client* ☐ *Disposal By Lab* ☐ *Archive For* ____ *Months*
Deliverable Requested: I, II, III, IV, Other (specify) Primary Deliverable Rank: 2	Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:

	Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
1	Alicia Scott FED EX	5/25/22 1430	EETSR	FED EX		
2	Relinquished by: FED EX	Date/Time:	Company	Received by: Sierra Worthington	MAY 26 2022 0900	Company EETSR
3	Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company

Custody Seals Intact: ∧ Yes ∆ No	Custody Seal No.:	Cooler Temperature(s) °C and Other Remarks:

6/8/2022

Electronic Filing: Received, Clerk's Office 10/31/2022

Eurofins Chicago
2417 Bond Street
University Park, IL 60484
Phone: 708-534-5200 Fax: 708-534-5211

Chain of Custody Record

eurofins Environment Testing America

Client Information (Sub Contract Lab)	Sampler:	Lab PM: Mockler, Diana J	Carrier Tracking No(s):	COC No: 500-161232.1
Client Contact: Shipping/Receiving	Phone:	E-Mail: Diana.Mockler@et.eurofinsus.com	State of Origin: Illinois	Page: Page 1 of 1
Company: TestAmerica Laboratories, Inc.		Accreditations Required (See note): NELAP - Illinois		Job #: 500-217043-6
Address: 13715 Rider Trail North,	Due Date Requested: 6/8/2022			
City: Earth City	TAT Requested (days):			
State, Zip: MO, 63045				
Phone: 314-298-8566(Tel) 314-298-8757(Fax)	PO #:			
Email:	WO #:			
Project Name: Waukegan Station Permit	Project #: 50004763			
Site: NRG Midwest Generation Waukegan	SSOW#:			

Analysis Requested

Preservation Codes:
A - HCL; B - NaOH; C - Zn Acetate; D - Nitric Acid; E - NaHSO4; F - MeOH; G - Amchlor; H - Ascorbic Acid; I - Ice; J - DI Water; K - EDTA; L - EDA; M - Hexane; N - None; O - AsNaO2; P - Na2O4S; Q - Na2SO3; R - Na2S2O3; S - H2SO4; T - TSP Dodecahydrate; U - Acetone; V - MCAA; W - pH 4-5; Y - Trizma; Z - other (specify); Other:

Sample Identification - Client ID (Lab ID)	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	903.0/PrecSep_21 Standard Target List	904.0/PrecSep_0 Standard Target List	Total Number of containers	Special Instructions/Note:
			Preservation Code:							
ELUC MW-10 (500-217043-14)	5/25/22	09:22 Central		Water			X	X	3	Batch QC must be performed (dup, spikes, etc) - no NCMs concerning limited volume:
ELUC MW-12 (500-217043-15)	5/25/22	10:03 Central		Water			X	X	3	Batch QC must be performed (dup, spikes, etc) - no NCMs concerning limited volume:

Note: Since laboratory accreditations are subject to change, Eurofins Chicago places the ownership of method, analyte & accreditation compliance upon out subcontract laboratories. This sample shipment is forwarded under chain-of-custody. If the laboratory does not currently maintain accreditation in the State of Origin listed above for analysis/tests/matrix being analyzed, the samples must be shipped back to the Eurofins Chicago laboratory or other instructions will be provided. Any changes to accreditation status should be brought to Eurofins Chicago attention immediately. If all requested accreditations are current to date, return the signed Chain of Custody attesting to said complicance to Eurofins Chicago.

Possible Hazard Identification	*Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)*
Unconfirmed	☐ *Return To Client* ☐ *Disposal By Lab* ☐ *Archive For* ____ *Months*
Deliverable Requested: I, II, III, IV, Other (specify) Primary Deliverable Rank: 2	Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:

Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
Shiri Scott	5/26/22 1315	EETA	FED EX		
Relinquished by: FED EX	Date/Time:	Company	Received by: Sierra Worthington	MAY 27 2022 1230	Company EMSL
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company

Custody Seals Intact: ∆ Yes ∆ No	Custody Seal No.:	Cooler Temperature(s) °C and Other Remarks:

10

Page 37 of 48

6/8/2022

Electronic Filing: Received, Clerk's Office 10/31/2022

Eurofins Chicago
2417 Bond Street
University Park, IL 60484
Phone 708-534-5200 Fax: 708-534-5211

Chain of Custody Record

eurofins Environment Testing America

Client Information (Sub Contract Lab)	Sampler	Lab PM: Mockler, Diana J	Carrier Tracking No(s):	COC No: 500-161465 1
Client Contact: Shipping/Receiving	Phone:	E-Mail: Diana.Mockler@et.eurofinsus.com	State of Origin: Illinois	Page: Page 1 of 1
Company: Eurofins Environment Testing Southeast,		Accreditations Required (See note): NELAP - Illinois		Job #: 500-217043-9
Address: 5102 LaRoche Avenue,	Due Date Requested: 6/7/2022			
City: Savannah	TAT Requested (days):			
State, Zip: GA, 31404				
Phone: 912-354-7858(Tel) 912-352-0165(Fax)	PO #:			
Email:	WO #:			
Project Name: Waukegan Station Permit	Project #: 50004763			
Site: NRG Midwest Generation Waukegan	SSOW#:			

Analysis Requested

Preservation Codes:
A - HCL, B - NaOH, C - Zn Acetate, D - Nitric Acid, E - NaHSO4, F - MeOH, G - Amchlor, H - Ascorbic Acid, I - Ice, J - DI Water, K - EDTA, L - EDA, M - Hexane, N - None, O - AsNaO2, P - Na2O4S, Q - Na2SO3, R - Na2S2O3, S - H2SO4, T - TSP Dodecahydrate, U - Acetone, V - MCAA, W - pH 4-5, Y - Trizma, Z - other (specify), Other

Sample Identification - Client ID (Lab ID)	Sample Date	Sample Time	Sample Type (C=Comp, G=grab)	Matrix (W=water S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	9012B/8012B_Prep Total Cyanide	Total Number of containers	Special Instructions/Note:
			Preservation Code:						
ELUC MW-10 (500-217043-14)	5/25/22	09.22 Central		Water			X	1	
ELUC MW-12 (500-217043-15)	5/25/22	10:03 Central		Water			X	1	

Note: Since laboratory accreditations are subject to change, Eurofins Chicago places the ownership of method, analyte & accreditation compliance upon out subcontract laboratories. This sample shipment is forwarded under chain-of-custody. If the laboratory does not currently maintain accreditation in the State of Origin listed above for analysis/tests/matrix being analyzed the samples must be shipped back to the Eurofins Chicago laboratory or other instructions will be provided. Any changes to accreditation status should be brought to Eurofins Chicago attention immediately. If all requested accreditations are current to date, return the signed Chain of Custody attesting to said compliance to Eurofins Chicago.

Possible Hazard Identification: Unconfirmed	Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): ☐ Return To Client ☐ Disposal By Lab ☐ Archive For _____ Months
Deliverable Requested: I, II, III, IV, Other (specify) — Primary Deliverable Rank: 2	Special Instructions/QC Requirements

Empty Kit Relinquished by:	Date	Time	Method of Shipment:

	Relinquished by	Date/Time	Company	Received by	Date/Time	Company
1	Shirl Scott	6/1/22 1400	BEAT			
2	Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
3	Relinquished by:	Date/Time:	Company	Received by:	Date/Time: 6/2 1040	Company

Custody Seals Intact: ∆ Yes ∆ No	Custody Seal No	Cooler Temperature(s) °C and Other Remarks: 0.9/0.3

6/8/2022

Electronic Filing: Received, Clerk's Office 10/31/2022

Eurofins Chicago
2417 Bond Street
University Park, IL 60484
Phone 708-534-5200 Fax: 708-534-5211

Chain of Custody Record

eurofins Environment Testing America

Client Information (Sub Contract Lab)	Sampler	Lab PM: Mockler, Diana J	Carrier Tracking No(s):	COC No: 500-161465 1
Client Contact: Shipping/Receiving	Phone:	E-Mail: Diana.Mockler@et.eurofinsus.com	State of Origin: Illinois	Page: Page 1 of 1
Company: Eurofins Environment Testing Southeast,		Accreditations Required (See note): NELAP - Illinois		Job #: 500-217043-8
Address: 5102 LaRoche Avenue,	Due Date Requested: 6/7/2022			
City: Savannah	TAT Requested (days):			
State, Zip: GA, 31404				
Phone: 912-354-7858(Tel) 912-352-0165(Fax)	PO #:			
Email:	WO #:			
Project Name: Waukegan Station Permit	Project #: 50004763			
Site: NRG Midwest Generation Waukegan	SSOW#:			

Analysis Requested

Preservation Codes:
A - HCL, B - NaOH, C - Zn Acetate, D - Nitric Acid, E - NaHSO4, F - MeOH, G - Amchlor, H - Ascorbic Acid, I - Ice, J - DI Water, K - EDTA, L - EDA, M - Hexane, N - None, O - AsNaO2, P - Na2O4S, Q - Na2SO3, R - Na2S2O3, S - H2SO4, T - TSP Dodecahydrate, U - Acetone, V - MCAA, W - pH 4-5, Y - Trizma, Z - other (specify)
Other:

Sample Identification - Client ID (Lab ID)	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	9012B/9012B_Prep Total Cyanide	Total Number of containers	Special Instructions/Note:
			Preservation Code:						
ELUC MW-11 (500-217043-11)	5/24/22	09 10 Central		Water			X	1	
ELUC MW-14 (500-217043-12)	5/24/22	10 08 Central		Water			X	1	
ELUC MW-15 (500-217043-13)	5/24/22	15 12 Central		Water			X	1	

Note: Since laboratory accreditations are subject to change, Eurofins Chicago places the ownership of method, analyte & accreditation compliance upon out subcontract laboratories. This sample shipment is forwarded under chain-of-custody If the laboratory does not currently maintain accreditation in the State of Origin listed above for analysis/tests/matrix being analyzed, the samples must be shipped back to the Eurofins Chicago laboratory or other instructions will be provided. Any changes to accreditation status should be brought to Eurofins Chicago attention immediately If all requested accreditations are current to date return the signed Chain of Custody attesting to said complicance to Eurofins Chicago.

Possible Hazard Identification: Unconfirmed	Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): ☐ Return To Client ☐ Disposal By Lab ☐ Archive For ____ Months
Deliverable Requested I, II, III, IV, Other (specify) Primary Deliverable Rank. 2	Special Instructions/QC Requirements

Empty Kit Relinquished by	Date	Time	Method of Shipment:

Relinquished by	Date/Time	Company	Received by	Date/Time:	Company
Shari Scott	6/1/22 1400	EETA			
Relinquished by	Date/Time:	Company	Received by	Date/Time:	Company
Relinquished by	Date/Time:	Company	Received by:	Date/Time: 6/2 0040	Company

Custody Seals Intact: ☐ Yes ☐ No	Custody Seal No	Cooler Temperature(s) °C and Other Remarks. 0.9/0.3

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06/07/2022

Electronic Filing: Received, Clerk's Office 10/31/2022

Eurofins Chicago
2417 Bond Street
University Park, IL 60484
Phone 708-534-5200 Fax: 708-534-5211

Chain of Custody Record

eurofins Environment Testing America

Client Information (Sub Contract Lab)	Sampler	Lab PM: Mockler, Diana J	Carrier Tracking No(s):	COC No: 500-161465 1
Client Contact: Shipping/Receiving	Phone:	E-Mail: Diana.Mockler@et.eurofinsus.com	State of Origin: Illinois	Page: Page 1 of 1
Company: Eurofins Environment Testing Southeast,		Accreditations Required (See note): NELAP - Illinois		Job #: 500-217043-7
Address: 5102 LaRoche Avenue, ,	Due Date Requested: 6/7/2022			
City: Savannah	TAT Requested (days):			
State, Zip: GA, 31404				
Phone: 912-354-7858(Tel) 912-352-0165(Fax)	PO #:			
Email:	WO #:			
Project Name: Waukegan Station Permit	Project #: 50004763			
Site: NRG Midwest Generation Waukegan	SSOW#:			

Analysis Requested

Preservation Codes:
A - HCL, B - NaOH, C - Zn Acetate, D - Nitric Acid, E - NaHSO4, F - MeOH, G - Amchlor, H - Ascorbic Acid, I - Ice, J - DI Water, K - EDTA, L - EDA, M - Hexane, N - None, O - AsNaO2, P - Na2O4S, Q - Na2SO3, R - Na2S2O3, S - H2SO4, T - TSP Dodecahydrate, U - Acetone, V - MCAA, W - pH 4-5, Y - Trizma, Z - other (specify), Other

Sample Identification - Client ID (Lab ID)	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	9012B/9012B_Prep Total Cyanide	Total Number of containers	Special Instructions/Note:
			Preservation Code:						
MW-08 (500-217043-9)	5/24/22	14:28 Central		Water			X	1	
MW-09 (500-217043-10)	5/24/22	11 10 Central		Water			X	1	

Note: Since laboratory accreditations are subject to change, Eurofins Chicago places the ownership of method, analyte & accreditation compliance upon out subcontract laboratories. This sample shipment is forwarded under chain-of-custody If the laboratory does not currently maintain accreditation in the State of Origin listed above for analysis/tests/matrix being analyzed, the samples must be shipped back to the Eurofins Chicago laboratory or other instructions will be provided. Any changes to accreditation status should be brought to Eurofins Chicago attention immediately If all requested accreditations are current to date, return the signed Chain of Custody attesting to said compliance to Eurofins Chicago.

Possible Hazard Identification: Unconfirmed	Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): ☐ Return To Client ☐ Disposal By Lab ☐ Archive For ____ Months
Deliverable Requested I, II, III, IV, Other (specify) Primary Deliverable Rank: 2	Special Instructions/QC Requirements

Empty Kit Relinquished by:	Date	Time	Method of Shipment:

	Relinquished by	Date/Time	Company	Received by	Date/Time	Company
1	[signature]	6/1/22 1400	PEST			
2	Relinquished by	Date/Time:	Company	Received by	Date/Time:	Company
3	Relinquished by	Date/Time:	Company	Received by: [signature]	Date/Time: 6/2 1040	Company

Custody Seals Intact: ☐ Yes ☐ No | Custody Seal No | Cooler Temperature(s) °C and Other Remarks: 0.9/0.3

Electronic Filing: Received, Clerk's Office 10/31/2022

Eurofins Chicago
2417 Bond Street
University Park, IL 60484
Phone 708-534-5200 Fax: 708-534-5211

Chain of Custody Record

eurofins Environment Testing America

Client Information (Sub Contract Lab)	Sampler	Lab PM: Mockler, Diana J	Carrier Tracking No(s):	COC No: 500-161465 1
Client Contact: Shipping/Receiving	Phone:	E-Mail: Diana.Mockler@et.eurofinsus.com	State of Origin: Illinois	Page: Page 1 of 1
Company: Eurofins Environment Testing Southeast,		Accreditations Required (See note): NELAP - Illinois		Job #: 500-217043-1
Address: 5102 LaRoche Avenue, ,	Due Date Requested: 6/7/2022			
City: Savannah	TAT Requested (days):			
State, Zip: GA, 31404				
Phone: 912-354-7858(Tel) 912-352-0165(Fax)	PO #:			
Email:	WO #:			
Project Name: Waukegan Station Permit	Project #: 50004763			
Site: NRG Midwest Generation Waukegan	SSOW#:			

Preservation Codes:
A - HCL, B - NaOH, C - Zn Acetate, D - Nitric Acid, E - NaHSO4, F - MeOH, G - Amchlor, H - Ascorbic Acid, I - Ice, J - DI Water, K - EDTA, L - EDA, M - Hexane, N - None, O - AsNaO2, P - Na2O4S, Q - Na2SO3, R - Na2S2O3, S - H2SO4, T - TSP Dodecahydrate, U - Acetone, V - MCAA, W - pH 4-5, Y - Trizma, Z - other (specify), Other

Analysis Requested

Sample Identification - Client ID (Lab ID)	Sample Date	Sample Time	Sample Type (C=Comp, G=grab)	Matrix (W=water S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	9012B/8012B_Prep Total Cyanide	Total Number of containers	Special Instructions/Note:
			Preservation Code:						
MW-01 (500-217043-1)	5/23/22	10.59 Central		Water			X	1	
MW-02 (500-217043-2)	5/23/22	11 53 Central		Water			X	1	
MW-03 (500-217043-3)	5/23/22	12.45 Central		Water			X	1	
MW-04 (500-217043-4)	5/23/22	13.57 Central		Water			X	1	
Duplicate (500-217043-5)	5/23/22	Central		Water			X	1	
MW-05 (500-217043-6)	5/24/22	12 11 Central		Water			X	1	
MW-06 (500-217043-7)	5/24/22	13 40 Central		Water			X	1	
MW-07 (500-217043-8)	5/24/22	13:01 Central		Water			X	1	

Note: Since laboratory accreditations are subject to change, Eurofins Chicago places the ownership of method, analyte & accreditation compliance upon out subcontract laboratories. This sample shipment is forwarded under chain-of-custody If the laboratory does not currently maintain accreditation in the State of Origin listed above for analysis/tests/matrix being analyzed, the samples must be shipped back to the Eurofins Chicago laboratory or other instructions will be provided. Any changes to accreditation status should be brought to Eurofins Chicago attention immediately If all requested accreditations are current to date, return the signed Chain of Custody attesting to said compliance to Eurofins Chicago.

Possible Hazard Identification: Unconfirmed	Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): ☐ Return To Client ☐ Disposal By Lab ☐ Archive For _____ Months
Deliverable Requested I, II, III, IV, Other (specify) Primary Deliverable Rank: 2	Special Instructions/QC Requirements

Empty Kit Relinquished by:	Date	Time	Method of Shipment:

	Relinquished by	Date/Time:	Company	Received by	Date/Time:	Company
1	Relinquished by: [signature]	6/1/22 1400	EET			
2	Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
3	Relinquished by:	Date/Time:	Company	Received by:	Date/Time: 6/2 1040	Company

Custody Seals Intact: ☐ Yes ☐ No	Custody Seal No	Cooler Temperature(s) °C and Other Remarks: 0.9/0.3

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6/8/2022

Electronic Filing: Received, Clerk's Office 10/31/2022

Login Sample Receipt Checklist

Client: KPRG and Associates, Inc.

Job Number: 500-217043-1

Login Number: 217043
List Number: 1
Creator: Hernandez, Stephanie

List Source: Eurofins Chicago

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	0.5,1.4,1.1,0.6,1.0,1.0
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	N/A	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Login Sample Receipt Checklist

Client: KPRG and Associates, Inc.

Job Number: 500-217043-1

Login Number: 217043
List Number: 5
Creator: Hartley, Tyler

List Source: Eurofins Savannah
List Creation: 06/02/22 11:32 AM

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	N/A	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	N/A	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Lab Chronicle

Client: KPRG and Associates, Inc.
Project/Site: Waukegan Station Permit

Job ID: 500-217043-1

Client Sample ID: MW-01

Lab Sample ID: 500-217043-1
Matrix: Water

Date Collected: 05/23/22 10:59
Date Received: 05/24/22 09:15

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total Recoverable	Prep	3005A			659524	06/02/22 08:56	BDE	TAL CHI
Total Recoverable	Analysis	6020A		1	660110	06/06/22 17:50	FXG	TAL CHI
Total Recoverable	Prep	3005A			659524	06/02/22 08:56	BDE	TAL CHI
Total Recoverable	Analysis	6020A		10	660193	06/07/22 12:06	FXG	TAL CHI
Total/NA	Prep	7470A			659757	06/03/22 09:55	MJG	TAL CHI
Total/NA	Analysis	7470A		1	659994	06/06/22 09:54	MJG	TAL CHI
Total/NA	Prep	9012B			724015	06/03/22 09:08	NVF	TAL SAV
Total/NA	Analysis	9012B		1	724141	06/03/22 12:38	NVF	TAL SAV
Total/NA	Analysis	9038		10	658956	05/27/22 14:20	LP	TAL CHI
Total/NA	Analysis	9251		2	658951	05/27/22 12:20	LP	TAL CHI
Total/NA	Analysis	Nitrate by calc		1	658975	05/27/22 20:09	PFK	TAL CHI
Total/NA	Analysis	SM 2540C		1	658372	05/25/22 01:06	CLB	TAL CHI
Total/NA	Analysis	SM 4500 F C		1	659084	05/27/22 20:08	EAT	TAL CHI
Total/NA	Analysis	SM 4500 NO2 B		1	658340	05/24/22 17:32	TMS	TAL CHI
Total/NA	Analysis	SM 4500 NO3 F		1	658789	05/26/22 15:20	PFK	TAL CHI

Client Sample ID: MW-02

Lab Sample ID: 500-217043-2
Matrix: Water

Date Collected: 05/23/22 11:53
Date Received: 05/24/22 09:15

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total Recoverable	Prep	3005A			659524	06/02/22 08:56	BDE	TAL CHI
Total Recoverable	Analysis	6020A		1	660110	06/06/22 17:54	FXG	TAL CHI
Total Recoverable	Prep	3005A			659524	06/02/22 08:56	BDE	TAL CHI
Total Recoverable	Analysis	6020A		10	660193	06/07/22 12:10	FXG	TAL CHI
Total/NA	Prep	7470A			659757	06/03/22 09:55	MJG	TAL CHI
Total/NA	Analysis	7470A		1	659994	06/06/22 09:57	MJG	TAL CHI
Total/NA	Prep	9012B			724015	06/03/22 09:08	NVF	TAL SAV
Total/NA	Analysis	9012B		1	724141	06/03/22 12:38	NVF	TAL SAV
Total/NA	Analysis	9038		10	658956	05/27/22 14:21	LP	TAL CHI
Total/NA	Analysis	9251		2	658951	05/27/22 12:20	LP	TAL CHI
Total/NA	Analysis	Nitrate by calc		1	658975	05/27/22 20:09	PFK	TAL CHI
Total/NA	Analysis	SM 2540C		1	658372	05/25/22 01:09	CLB	TAL CHI
Total/NA	Analysis	SM 4500 F C		1	659084	05/27/22 20:16	EAT	TAL CHI
Total/NA	Analysis	SM 4500 NO2 B		1	658340	05/24/22 17:33	TMS	TAL CHI
Total/NA	Analysis	SM 4500 NO3 F		1	658789	05/26/22 15:26	PFK	TAL CHI

Lab Chronicle

Client: KPRG and Associates, Inc.
Project/Site: Waukegan Station Permit

Job ID: 500-217043-1

Client Sample ID: MW-03

Lab Sample ID: 500-217043-3
Matrix: Water
Date Collected: 05/23/22 12:45
Date Received: 05/24/22 09:15

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total Recoverable	Prep	3005A			659524	06/02/22 08:56	BDE	TAL CHI
Total Recoverable	Analysis	6020A		1	660110	06/06/22 17:57	FXG	TAL CHI
Total Recoverable	Prep	3005A			659524	06/02/22 08:56	BDE	TAL CHI
Total Recoverable	Analysis	6020A		10	660193	06/07/22 12:13	FXG	TAL CHI
Total/NA	Prep	7470A			659757	06/03/22 09:55	MJG	TAL CHI
Total/NA	Analysis	7470A		1	659994	06/06/22 09:59	MJG	TAL CHI
Total/NA	Prep	9012B			724015	06/03/22 09:08	NVF	TAL SAV
Total/NA	Analysis	9012B		1	724141	06/03/22 12:38	NVF	TAL SAV
Total/NA	Analysis	9038		10	658956	05/27/22 14:22	LP	TAL CHI
Total/NA	Analysis	9251		2	658951	05/27/22 12:52	LP	TAL CHI
Total/NA	Analysis	Nitrate by calc		1	658975	05/27/22 20:16	PFK	TAL CHI
Total/NA	Analysis	SM 2540C		1	658372	05/25/22 01:12	CLB	TAL CHI
Total/NA	Analysis	SM 4500 F C		1	659084	05/27/22 20:19	EAT	TAL CHI
Total/NA	Analysis	SM 4500 NO2 B		1	658340	05/24/22 17:34	TMS	TAL CHI
Total/NA	Analysis	SM 4500 NO3 F		1	658789	05/26/22 16:33	PFK	TAL CHI

Client Sample ID: MW-04

Lab Sample ID: 500-217043-4
Matrix: Water
Date Collected: 05/23/22 13:57
Date Received: 05/24/22 09:15

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total Recoverable	Prep	3005A			659524	06/02/22 08:56	BDE	TAL CHI
Total Recoverable	Analysis	6020A		1	660110	06/06/22 18:01	FXG	TAL CHI
Total Recoverable	Prep	3005A			659524	06/02/22 08:56	BDE	TAL CHI
Total Recoverable	Analysis	6020A		10	660193	06/07/22 12:17	FXG	TAL CHI
Total/NA	Prep	7470A			659757	06/03/22 09:55	MJG	TAL CHI
Total/NA	Analysis	7470A		1	659994	06/06/22 10:01	MJG	TAL CHI
Total/NA	Prep	9012B			724015	06/03/22 09:08	NVF	TAL SAV
Total/NA	Analysis	9012B		1	724141	06/03/22 12:38	NVF	TAL SAV
Total/NA	Analysis	9038		10	658956	05/27/22 14:22	LP	TAL CHI
Total/NA	Analysis	9251		2	658951	05/27/22 12:53	LP	TAL CHI
Total/NA	Analysis	Nitrate by calc		1	658975	05/27/22 20:16	PFK	TAL CHI
Total/NA	Analysis	SM 2540C		1	658372	05/25/22 01:14	CLB	TAL CHI
Total/NA	Analysis	SM 4500 F C		1	659084	05/27/22 20:23	EAT	TAL CHI
Total/NA	Analysis	SM 4500 NO2 B		1	658340	05/24/22 17:34	TMS	TAL CHI
Total/NA	Analysis	SM 4500 NO3 F		1	658789	05/26/22 16:35	PFK	TAL CHI

Lab Chronicle

Client: KPRG and Associates, Inc.
Project/Site: Waukegan Station Permit

Job ID: 500-217043-1

Client Sample ID: Duplicate

Date Collected: 05/23/22 00:00
Date Received: 05/24/22 09:15

Lab Sample ID: 500-217043-5
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total Recoverable	Prep	3005A			659524	06/02/22 08:56	BDE	TAL CHI
Total Recoverable	Analysis	6020A		1	660110	06/06/22 18:04	FXG	TAL CHI
Total Recoverable	Prep	3005A			659524	06/02/22 08:56	BDE	TAL CHI
Total Recoverable	Analysis	6020A		10	660193	06/07/22 12:20	FXG	TAL CHI
Total/NA	Prep	7470A			659757	06/03/22 09:55	MJG	TAL CHI
Total/NA	Analysis	7470A		1	659994	06/06/22 10:03	MJG	TAL CHI
Total/NA	Prep	9012B			724015	06/03/22 09:08	NVF	TAL SAV
Total/NA	Analysis	9012B		1	724141	06/03/22 12:38	NVF	TAL SAV
Total/NA	Analysis	9038		50	658956	05/27/22 14:22	LP	TAL CHI
Total/NA	Analysis	9251		1	658951	05/27/22 12:53	LP	TAL CHI
Total/NA	Analysis	Nitrate by calc		1	658975	05/27/22 20:16	PFK	TAL CHI
Total/NA	Analysis	SM 2540C		1	658372	05/25/22 01:17	CLB	TAL CHI
Total/NA	Analysis	SM 4500 F C		1	659084	05/27/22 20:36	EAT	TAL CHI
Total/NA	Analysis	SM 4500 NO2 B		1	658340	05/24/22 17:35	TMS	TAL CHI
Total/NA	Analysis	SM 4500 NO3 F		1	658789	05/26/22 16:37	PFK	TAL CHI

Client Sample ID: MW-05

Date Collected: 05/24/22 12:11
Date Received: 05/25/22 09:40

Lab Sample ID: 500-217043-6
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total Recoverable	Prep	3005A			659524	06/02/22 08:56	BDE	TAL CHI
Total Recoverable	Analysis	6020A		1	660110	06/06/22 18:07	FXG	TAL CHI
Total Recoverable	Prep	3005A			659524	06/02/22 08:56	BDE	TAL CHI
Total Recoverable	Analysis	6020A		20	660193	06/07/22 12:24	FXG	TAL CHI
Total/NA	Prep	7470A			659757	06/03/22 09:55	MJG	TAL CHI
Total/NA	Analysis	7470A		1	659994	06/06/22 10:05	MJG	TAL CHI
Total/NA	Prep	9012B			724015	06/03/22 09:08	NVF	TAL SAV
Total/NA	Analysis	9012B		1	724141	06/03/22 12:45	NVF	TAL SAV
Total/NA	Analysis	9038		50	658956	05/27/22 14:23	LP	TAL CHI
Total/NA	Analysis	9251		1	658951	05/27/22 12:53	LP	TAL CHI
Total/NA	Analysis	Nitrate by calc		1	658975	05/27/22 20:16	PFK	TAL CHI
Total/NA	Analysis	SM 2540C		1	659110	05/31/22 00:01	CLB	TAL CHI
Total/NA	Analysis	SM 4500 F C		1	659084	05/27/22 20:40	EAT	TAL CHI
Total/NA	Analysis	SM 4500 NO2 B		1	658504	05/25/22 12:57	TMS	TAL CHI
Total/NA	Analysis	SM 4500 NO3 F		1	658789	05/26/22 16:39	PFK	TAL CHI

Lab Chronicle

Client: KPRG and Associates, Inc.
Project/Site: Waukegan Station Permit

Job ID: 500-217043-1

Client Sample ID: MW-06

Lab Sample ID: 500-217043-7
Matrix: Water
Date Collected: 05/24/22 13:40
Date Received: 05/25/22 09:40

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total Recoverable	Prep	3005A			659524	06/02/22 08:56	BDE	TAL CHI
Total Recoverable	Analysis	6020A		1	660110	06/06/22 18:11	FXG	TAL CHI
Total Recoverable	Prep	3005A			659524	06/02/22 08:56	BDE	TAL CHI
Total Recoverable	Analysis	6020A		10	660193	06/07/22 12:27	FXG	TAL CHI
Total/NA	Prep	7470A			659757	06/03/22 09:55	MJG	TAL CHI
Total/NA	Analysis	7470A		1	659994	06/06/22 10:07	MJG	TAL CHI
Total/NA	Prep	9012B			724015	06/03/22 09:08	NVF	TAL SAV
Total/NA	Analysis	9012B		1	724141	06/03/22 12:45	NVF	TAL SAV
Total/NA	Analysis	9038		5	658956	05/27/22 14:53	LP	TAL CHI
Total/NA	Analysis	9251		2	658951	05/27/22 12:53	LP	TAL CHI
Total/NA	Analysis	Nitrate by calc		1	658975	05/27/22 20:16	PFK	TAL CHI
Total/NA	Analysis	SM 2540C		1	659110	05/31/22 00:03	CLB	TAL CHI
Total/NA	Analysis	SM 4500 F C		1	659084	05/27/22 20:43	EAT	TAL CHI
Total/NA	Analysis	SM 4500 NO2 B		1	658504	05/25/22 12:57	TMS	TAL CHI
Total/NA	Analysis	SM 4500 NO3 F		1	658789	05/26/22 16:41	PFK	TAL CHI

Client Sample ID: MW-07

Lab Sample ID: 500-217043-8
Matrix: Water
Date Collected: 05/24/22 13:01
Date Received: 05/25/22 09:40

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total Recoverable	Prep	3005A			659524	06/02/22 08:56	BDE	TAL CHI
Total Recoverable	Analysis	6020A		1	660110	06/06/22 18:14	FXG	TAL CHI
Total Recoverable	Prep	3005A			659524	06/02/22 08:56	BDE	TAL CHI
Total Recoverable	Analysis	6020A		100	660193	06/07/22 12:30	FXG	TAL CHI
Total/NA	Prep	7470A			659757	06/03/22 09:55	MJG	TAL CHI
Total/NA	Analysis	7470A		1	659994	06/06/22 10:09	MJG	TAL CHI
Total/NA	Prep	9012B			724015	06/03/22 09:08	NVF	TAL SAV
Total/NA	Analysis	9012B		1	724141	06/03/22 13:00	NVF	TAL SAV
Total/NA	Analysis	9038		50	658956	05/27/22 14:54	LP	TAL CHI
Total/NA	Analysis	9251		1	658951	05/27/22 12:53	LP	TAL CHI
Total/NA	Analysis	Nitrate by calc		1	658975	05/27/22 20:16	PFK	TAL CHI
Total/NA	Analysis	SM 2540C		1	659110	05/31/22 00:06	CLB	TAL CHI
Total/NA	Analysis	SM 4500 F C		1	659084	05/27/22 20:46	EAT	TAL CHI
Total/NA	Analysis	SM 4500 NO2 B		1	658504	05/25/22 12:58	TMS	TAL CHI
Total/NA	Analysis	SM 4500 NO3 F		1	658789	05/26/22 16:43	PFK	TAL CHI

Laboratory References:

TAL CHI = Eurofins Chicago, 2417 Bond Street, University Park, IL 60484, TEL (708)534-5200

TAL SAV = Eurofins Savannah, 5102 LaRoche Avenue, Savannah, GA 31404, TEL (912)354-7858

Accreditation/Certification Summary

Client: KPRG and Associates, Inc.
Project/Site: Waukegan Station Permit

Job ID: 500-217043-1

Laboratory: Eurofins Chicago

The accreditations/certifications listed below are applicable to this report.

Authority	Program	Identification Number	Expiration Date
Illinois	NELAP	IL00035	04-30-23

Laboratory: Eurofins Savannah

The accreditations/certifications listed below are applicable to this report.

Authority	Program	Identification Number	Expiration Date
Illinois	NELAP	200022	11-30-22

Electronic Filing: Received, Clerk's Office 10/31/2022

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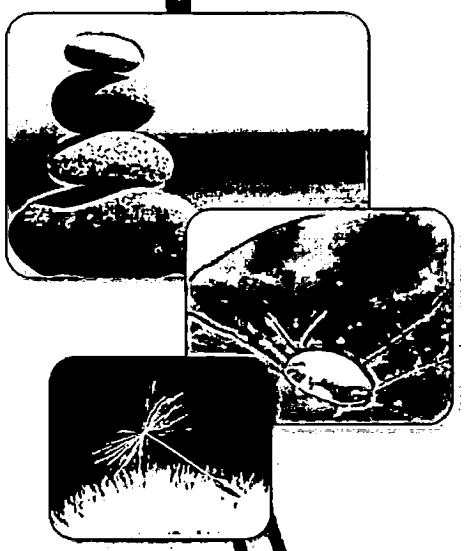

ANALYTICAL REPORT

Eurofins Chicago
2417 Bond Street
University Park, IL 60484
Tel: (708)534-5200

Laboratory Job ID: 500-217043-2
Client Project/Site: Waukegan Station Permit (RAD)

For:
KPRG and Associates, Inc.
14665 West Lisbon Road,
Suite 1A
Brookfield, Wisconsin 53005

Attn: Richard Gnat

Diana Mockler

Authorized for release by:
6/24/2022 1:40:47 PM

Diana Mockler, Project Manager I
(219)252-7570
Diana.Mockler@et.eurofinsus.com

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This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

Client: KPRG and Associates, Inc.
Project/Site: Waukegan Station Permit (RAD)

Laboratory Job ID: 500-217043-2

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Case Narrative

Client: KPRG and Associates, Inc.
Project/Site: Waukegan Station Permit (RAD)

Job ID: 500-217043-2

Job ID: 500-217043-2

Laboratory: Eurofins Chicago

Narrative

Job Narrative
500-217043-2

Comments
No additional comments.

Receipt
The samples were received on 5/24/2022 9:15 AM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperatures of the 6 coolers at receipt time were 0.5° C, 0.6° C, 1.0° C, 1.0° C, 1.1° C and 1.4° C.

RAD
Method 903.0: Radium-226 batch 567407:
Any minimum detectable concentration (MDC), critical value (DLC), or Safe Drinking Water Act detection limit (SDWA DL) is sample-specific unless otherwise stated elsewhere in this narrative. Radiochemistry sample results are reported with the count date/time applied as the Activity Reference Date.
MW-01 (500-217043-1), MW-02 (500-217043-2), MW-03 (500-217043-3), MW-04 (500-217043-4), Duplicate (500-217043-5), (LCS 160-567407/1-A), (MB 160-567407/16-A), (500-217068-C-1-A) and (500-217068-E-1-A DU)

Method 903.0: Radium-226 batch 567635
Any minimum detectable concentration (MDC), critical value (DLC), or Safe Drinking Water Act detection limit (SDWA DL) is sample-specific unless otherwise stated elsewhere in this narrative. Radiochemistry sample results are reported with the count date/time applied as the Activity Reference Date.
MW-05 (500-217043-6), MW-06 (500-217043-7), MW-07 (500-217043-8), (LCS 160-567635/1-A), (MB 160-567635/22-A) and (500-217043-G-8-B DU)

Method 904.0: Radium-228 batch 567410
Any minimum detectable concentration (MDC), critical value (DLC), or Safe Drinking Water Act detection limit (SDWA DL) is sample-specific unless otherwise stated elsewhere in this narrative. Radiochemistry sample results are reported with the count date/time applied as the Activity Reference Date.
MW-01 (500-217043-1), MW-02 (500-217043-2), MW-03 (500-217043-3), MW-04 (500-217043-4), Duplicate (500-217043-5), (LCS 160-567410/1-A), (MB 160-567410/16-A), (500-217068-C-1-B) and (500-217068-E-1-B DU)

Method 904.0: Radium-228 batch 567644
Any minimum detectable concentration (MDC), critical value (DLC), or Safe Drinking Water Act detection limit (SDWA DL) is sample-specific unless otherwise stated elsewhere in this narrative. Radiochemistry sample results are reported with the count date/time applied as the Activity Reference Date.
MW-05 (500-217043-6), MW-06 (500-217043-7), MW-07 (500-217043-8), (LCS 160-567644/1-A), (MB 160-567644/22-A) and (500-217043-G-8-C DU)

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

Method Summary

Client: KPRG and Associates, Inc.
Project/Site: Waukegan Station Permit (RAD)

Job ID: 500-217043-2

Method	Method Description	Protocol	Laboratory
903.0	Radium-226 (GFPC)	EPA	TAL SL
904.0	Radium-228 (GFPC)	EPA	TAL SL
PrecSep_0	Preparation, Precipitate Separation	None	TAL SL
PrecSep-21	Preparation, Precipitate Separation (21-Day In-Growth)	None	TAL SL

Protocol References:

EPA = US Environmental Protection Agency
None = None

Laboratory References:

TAL SL = Eurofins St. Louis, 13715 Rider Trail North, Earth City, MO 63045, TEL (314)298-8566

Sample Summary

Client: KPRG and Associates, Inc.
Project/Site: Waukegan Station Permit (RAD)

Job ID: 500-217043-2

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
500-217043-1	MW-01	Water	05/23/22 10:59	05/24/22 09:15
500-217043-2	MW-02	Water	05/23/22 11:53	05/24/22 09:15
500-217043-3	MW-03	Water	05/23/22 12:45	05/24/22 09:15
500-217043-4	MW-04	Water	05/23/22 13:57	05/24/22 09:15
500-217043-5	Duplicate	Water	05/23/22 00:00	05/24/22 09:15
500-217043-6	MW-05	Water	05/24/22 12:11	05/25/22 09:40
500-217043-7	MW-06	Water	05/24/22 13:40	05/25/22 09:40
500-217043-8	MW-07	Water	05/24/22 13:01	05/25/22 09:40

Client Sample Results

Client: KPRG and Associates, Inc.
Project/Site: Waukegan Station Permit (RAD)

Job ID: 500-217043-2

Client Sample ID: MW-01

Lab Sample ID: 500-217043-1
Matrix: Water
Date Collected: 05/23/22 10:59
Date Received: 05/24/22 09:15

Method: 903.0 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	<0.201	U	0.135	0.136	1.00	0.201	pCi/L	05/26/22 10:39	06/17/22 08:37	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*92.8*		*40 - 110*	*05/26/22 10:39*	*06/17/22 08:37*	*1*

Method: 904.0 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	<0.425	U	0.281	0.283	1.00	0.425	pCi/L	05/26/22 10:58	06/15/22 11:36	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*92.8*		*40 - 110*	*05/26/22 10:58*	*06/15/22 11:36*	*1*
Y Carrier	*89.3*		*40 - 110*	*05/26/22 10:58*	*06/15/22 11:36*	*1*

Client Sample ID: MW-02

Lab Sample ID: 500-217043-2
Matrix: Water
Date Collected: 05/23/22 11:53
Date Received: 05/24/22 09:15

Method: 903.0 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	<0.208	U	0.107	0.107	1.00	0.208	pCi/L	05/26/22 10:39	06/17/22 08:37	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*91.8*		*40 - 110*	*05/26/22 10:39*	*06/17/22 08:37*	*1*

Method: 904.0 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	<0.470	U	0.306	0.308	1.00	0.470	pCi/L	05/26/22 10:58	06/15/22 11:36	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*91.8*		*40 - 110*	*05/26/22 10:58*	*06/15/22 11:36*	*1*
Y Carrier	*89.7*		*40 - 110*	*05/26/22 10:58*	*06/15/22 11:36*	*1*

Client Sample ID: MW-03

Lab Sample ID: 500-217043-3
Matrix: Water
Date Collected: 05/23/22 12:45
Date Received: 05/24/22 09:15

Method: 903.0 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	<0.161	U	0.0695	0.0695	1.00	0.161	pCi/L	05/26/22 10:39	06/17/22 08:38	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*92.3*		*40 - 110*	*05/26/22 10:39*	*06/17/22 08:38*	*1*

Client Sample Results

Client: KPRG and Associates, Inc.
Project/Site: Waukegan Station Permit (RAD)

Job ID: 500-217043-2

Client Sample ID: MW-03

Lab Sample ID: 500-217043-3
Matrix: Water
Date Collected: 05/23/22 12:45
Date Received: 05/24/22 09:15

Method: 904.0 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	<0.493	U	0.252	0.252	1.00	0.493	pCi/L	05/26/22 10:58	06/15/22 11:37	1

Carrier	%Yield	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Ba Carrier	92.3		40 - 110	05/26/22 10:58	06/15/22 11:37	1
Y Carrier	85.6		40 - 110	05/26/22 10:58	06/15/22 11:37	1

Client Sample ID: MW-04

Lab Sample ID: 500-217043-4
Matrix: Water
Date Collected: 05/23/22 13:57
Date Received: 05/24/22 09:15

Method: 903.0 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	<0.209	U	0.118	0.118	1.00	0.209	pCi/L	05/26/22 10:39	06/17/22 08:38	1

Carrier	%Yield	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Ba Carrier	95.0		40 - 110	05/26/22 10:39	06/17/22 08:38	1

Method: 904.0 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	<0.390	U	0.189	0.189	1.00	0.390	pCi/L	05/26/22 10:58	06/15/22 11:37	1

Carrier	%Yield	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Ba Carrier	95.0		40 - 110	05/26/22 10:58	06/15/22 11:37	1
Y Carrier	86.0		40 - 110	05/26/22 10:58	06/15/22 11:37	1

Client Sample ID: Duplicate

Lab Sample ID: 500-217043-5
Matrix: Water
Date Collected: 05/23/22 00:00
Date Received: 05/24/22 09:15

Method: 903.0 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	<0.171	U	0.109	0.110	1.00	0.171	pCi/L	05/26/22 10:39	06/17/22 08:38	1

Carrier	%Yield	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Ba Carrier	97.3		40 - 110	05/26/22 10:39	06/17/22 08:38	1

Method: 904.0 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	<0.372	U	0.201	0.201	1.00	0.372	pCi/L	05/26/22 10:58	06/15/22 11:37	1

Carrier	%Yield	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Ba Carrier	97.3		40 - 110	05/26/22 10:58	06/15/22 11:37	1

Client Sample Results

Client: KPRG and Associates, Inc.
Project/Site: Waukegan Station Permit (RAD)

Job ID: 500-217043-2

Client Sample ID: Duplicate

Lab Sample ID: 500-217043-5
Matrix: Water
Date Collected: 05/23/22 00:00
Date Received: 05/24/22 09:15

Method: 904.0 - Radium-228 (GFPC) (Continued)

Carrier	%Yield	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Y Carrier	88.2		40 - 110	05/26/22 10:58	06/15/22 11:37	1

Client Sample ID: MW-05

Lab Sample ID: 500-217043-6
Matrix: Water
Date Collected: 05/24/22 12:11
Date Received: 05/25/22 09:40

Method: 903.0 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	**0.186**		0.121	0.122	1.00	0.167	pCi/L	05/27/22 12:50	06/21/22 08:52	1

Carrier	%Yield	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Ba Carrier	72.3		40 - 110	05/27/22 12:50	06/21/22 08:52	1

Method: 904.0 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	**0.875**		0.501	0.508	1.00	0.727	pCi/L	05/27/22 14:36	06/15/22 14:00	1

Carrier	%Yield	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Ba Carrier	72.3		40 - 110	05/27/22 14:36	06/15/22 14:00	1
Y Carrier	81.9		40 - 110	05/27/22 14:36	06/15/22 14:00	1

Client Sample ID: MW-06

Lab Sample ID: 500-217043-7
Matrix: Water
Date Collected: 05/24/22 13:40
Date Received: 05/25/22 09:40

Method: 903.0 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	<0.150	U	0.0985	0.0991	1.00	0.150	pCi/L	05/27/22 12:50	06/21/22 08:53	1

Carrier	%Yield	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Ba Carrier	95.0		40 - 110	05/27/22 12:50	06/21/22 08:53	1

Method: 904.0 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	<0.576	U	0.370	0.373	1.00	0.576	pCi/L	05/27/22 14:36	06/15/22 14:00	1

Carrier	%Yield	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Ba Carrier	95.0		40 - 110	05/27/22 14:36	06/15/22 14:00	1
Y Carrier	81.1		40 - 110	05/27/22 14:36	06/15/22 14:00	1

Client Sample Results

Client: KPRG and Associates, Inc.
Project/Site: Waukegan Station Permit (RAD)

Job ID: 500-217043-2

Client Sample ID: MW-07
Date Collected: 05/24/22 13:01
Date Received: 05/25/22 09:40

Lab Sample ID: 500-217043-8
Matrix: Water

Method: 903.0 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	**0.355**		0.142	0.146	1.00	0.164	pCi/L	05/27/22 12:50	06/21/22 08:53	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*83.8*		*40 - 110*	*05/27/22 12:50*	*06/21/22 08:53*	*1*

Method: 904.0 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	**1.40**		0.463	0.481	1.00	0.543	pCi/L	05/27/22 14:36	06/15/22 14:01	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*83.8*		*40 - 110*	*05/27/22 14:36*	*06/15/22 14:01*	*1*
Y Carrier	*84.9*		*40 - 110*	*05/27/22 14:36*	*06/15/22 14:01*	*1*

Definitions/Glossary

Client: KPRG and Associates, Inc. Job ID: 500-217043-2
Project/Site: Waukegan Station Permit (RAD)

Qualifiers

Rad

Qualifier	Qualifier Description
U	Result is less than the sample detection limit.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

QC Association Summary

Client: KPRG and Associates, Inc.
Project/Site: Waukegan Station Permit (RAD)

Job ID: 500-217043-2

Rad

Prep Batch: 567407

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-217043-1	MW-01	Total/NA	Water	PrecSep-21	
500-217043-2	MW-02	Total/NA	Water	PrecSep-21	
500-217043-3	MW-03	Total/NA	Water	PrecSep-21	
500-217043-4	MW-04	Total/NA	Water	PrecSep-21	
500-217043-5	Duplicate	Total/NA	Water	PrecSep-21	
MB 160-567407/16-A	Method Blank	Total/NA	Water	PrecSep-21	
LCS 160-567407/1-A	Lab Control Sample	Total/NA	Water	PrecSep-21	

Prep Batch: 567410

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-217043-1	MW-01	Total/NA	Water	PrecSep_0	
500-217043-2	MW-02	Total/NA	Water	PrecSep_0	
500-217043-3	MW-03	Total/NA	Water	PrecSep_0	
500-217043-4	MW-04	Total/NA	Water	PrecSep_0	
500-217043-5	Duplicate	Total/NA	Water	PrecSep_0	
MB 160-567410/16-A	Method Blank	Total/NA	Water	PrecSep_0	
LCS 160-567410/1-A	Lab Control Sample	Total/NA	Water	PrecSep_0	

Prep Batch: 567635

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-217043-6	MW-05	Total/NA	Water	PrecSep-21	
500-217043-7	MW-06	Total/NA	Water	PrecSep-21	
500-217043-8	MW-07	Total/NA	Water	PrecSep-21	
MB 160-567635/22-A	Method Blank	Total/NA	Water	PrecSep-21	
LCS 160-567635/1-A	Lab Control Sample	Total/NA	Water	PrecSep-21	
500-217043-8 DU	MW-07	Total/NA	Water	PrecSep-21	

Prep Batch: 567644

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-217043-6	MW-05	Total/NA	Water	PrecSep_0	
500-217043-7	MW-06	Total/NA	Water	PrecSep_0	
500-217043-8	MW-07	Total/NA	Water	PrecSep_0	
MB 160-567644/22-A	Method Blank	Total/NA	Water	PrecSep_0	
LCS 160-567644/1-A	Lab Control Sample	Total/NA	Water	PrecSep_0	
500-217043-8 DU	MW-07	Total/NA	Water	PrecSep_0	

QC Sample Results

Client: KPRG and Associates, Inc.
Project/Site: Waukegan Station Permit (RAD)

Job ID: 500-217043-2

Method: 903.0 - Radium-226 (GFPC)

Lab Sample ID: MB 160-567407/16-A
Matrix: Water
Analysis Batch: 570475

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 567407

Analyte	MB Result	MB Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	<0.157	U	0.0827	0.0828	1.00	0.157	pCi/L	05/26/22 10:39	06/17/22 08:39	1

Carrier	*MB %Yield*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*99.8*		*40 - 110*	*05/26/22 10:39*	*06/17/22 08:39*	*1*

Lab Sample ID: LCS 160-567407/1-A
Matrix: Water
Analysis Batch: 570475

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 567407

Analyte			Spike Added	LCS Result	LCS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec Limits		
Radium-226			11.3	9.101		1.07	1.00	0.173	pCi/L	80	75 - 125		

Carrier	*LCS %Yield*	*LCS Qualifier*	*Limits*
Ba Carrier	*98.8*		*40 - 110*

Lab Sample ID: MB 160-567635/22-A
Matrix: Water
Analysis Batch: 570924

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 567635

Analyte	MB Result	MB Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	<0.134	U	0.0619	0.0619	1.00	0.134	pCi/L	05/27/22 12:50	06/21/22 08:56	1

Carrier	*MB %Yield*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*84.8*		*40 - 110*	*05/27/22 12:50*	*06/21/22 08:56*	*1*

Lab Sample ID: LCS 160-567635/1-A
Matrix: Water
Analysis Batch: 570920

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 567635

Analyte			Spike Added	LCS Result	LCS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec Limits		
Radium-226			11.3	10.60		1.13	1.00	0.139	pCi/L	93	75 - 125		

Carrier	*LCS %Yield*	*LCS Qualifier*	*Limits*
Ba Carrier	*95.5*		*40 - 110*

Lab Sample ID: 500-217043-8 DU
Matrix: Water
Analysis Batch: 570923

Client Sample ID: MW-07
Prep Type: Total/NA
Prep Batch: 567635

Analyte	Sample Result	Sample Qual		DU Result	DU Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit			RER	RER Limit
Radium-226	0.355			0.3390		0.152	1.00	0.183	pCi/L			0.05	1

QC Sample Results

Client: KPRG and Associates, Inc.
Project/Site: Waukegan Station Permit (RAD)

Job ID: 500-217043-2

Method: 903.0 - Radium-226 (GFPC) (Continued)

Lab Sample ID: 500-217043-8 DU
Matrix: Water
Analysis Batch: 570923

Client Sample ID: MW-07
Prep Type: Total/NA
Prep Batch: 567635

Carrier	DU %Yield	DU Qualifier	Limits
Ba Carrier	77.0		40 - 110

Method: 904.0 - Radium-228 (GFPC)

Lab Sample ID: MB 160-567410/16-A
Matrix: Water
Analysis Batch: 570137

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 567410

Analyte	MB Result	MB Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	<0.423	U	0.247	0.247	1.00	0.423	pCi/L	05/26/22 10:58	06/15/22 11:37	1

Carrier	MB %Yield	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
Ba Carrier	99.8		40 - 110	05/26/22 10:58	06/15/22 11:37	1
Y Carrier	90.8		40 - 110	05/26/22 10:58	06/15/22 11:37	1

Lab Sample ID: LCS 160-567410/1-A
Matrix: Water
Analysis Batch: 570137

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 567410

Analyte	Spike Added	LCS Result	LCS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec Limits
Radium-228	8.53	7.951		1.07	1.00	0.462	pCi/L	93	75 - 125

Carrier	LCS %Yield	LCS Qualifier	Limits
Ba Carrier	98.8		40 - 110
Y Carrier	92.7		40 - 110

Lab Sample ID: MB 160-567644/22-A
Matrix: Water
Analysis Batch: 570137

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 567644

Analyte	MB Result	MB Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	<0.603	U	0.359	0.360	1.00	0.603	pCi/L	05/27/22 14:36	06/15/22 14:05	1

Carrier	MB %Yield	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
Ba Carrier	84.8		40 - 110	05/27/22 14:36	06/15/22 14:05	1
Y Carrier	87.5		40 - 110	05/27/22 14:36	06/15/22 14:05	1

Lab Sample ID: LCS 160-567644/1-A
Matrix: Water
Analysis Batch: 570152

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 567644

Analyte	Spike Added	LCS Result	LCS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec Limits
Radium-228	8.53	9.528		1.27	1.00	0.477	pCi/L	112	75 - 125

QC Sample Results

Client: KPRG and Associates, Inc.
Project/Site: Waukegan Station Permit (RAD)

Job ID: 500-217043-2

Method: 904.0 - Radium-228 (GFPC) (Continued)

Lab Sample ID: LCS 160-567644/1-A
Matrix: Water
Analysis Batch: 570152

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 567644

Carrier	LCS %Yield	LCS Qualifier	Limits
Ba Carrier	95.5		40 - 110
Y Carrier	86.4		40 - 110

Lab Sample ID: 500-217043-8 DU
Matrix: Water
Analysis Batch: 570152

Client Sample ID: MW-07
Prep Type: Total/NA
Prep Batch: 567644

Analyte	Sample Result	Sample Qual		DU Result	DU Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit			RER	RER Limit
Radium-228	1.40			1.544		0.543	1.00	0.637	pCi/L			0.14	1

Carrier	DU %Yield	DU Qualifier	Limits
Ba Carrier	77.0		40 - 110
Y Carrier	84.9		40 - 110

Eurofins TestAmerica, Chicago
2417 Bond Street
University Park IL 60484
Phone (708) 534-5200 Phone (708) 534-5211

Chain of Custody Record

eurofins | Environment Testing America

Client Information	Sampler: M. Mitchel Dolan + Kaelyn Sperle	Lab PM: Mockler Diana J	Carrier Tracking No(s):	COC No: 500-96049-42473 1
Client Contact: Mitchel Dolan	Phone: 262-622-1143	E-Mail: Diana.Mockler@Eurofinset.com	State of Origin: IL	Page: Page 1 of 1
Company: KPRG and Associates Inc	PWSID:			Job #: 500-217043
Address: 14665 West Lisbon Road Suite 1A	Due Date Requested:			
City: Brookfield	TAT Requested (days):			
State, Zip: WI 53005	Compliance Project: Δ Yes Δ No			
Phone: 262 781-0475(Tel)	PO #: 4502012555			
Email: mitcheld@kprginc.com	WO #:			
Project Name: Waukegan Station Permit	Project #: 50004763			
Site: Illinois	SSOW#:			

Analysis Requested

500-217043 COC

Preservation Codes

A	HCL	M	Hexane
B	NaOH	N	None
C	Zn Acetate	O	AsNaO2
D	Nitric Acid	P	Na2O4S
E	NaHSO4	Q	Na2SO3
F	MeOH	R	Na2S2O3
G	Amchlor	S	H2SO4
H	Ascorbic Acid	T	TSP Dodecahydrate
I	Ice	U	Acetone
J	DI Water	V	MCAA
K	EDTA	W	pH 4-5
L	EDA	Z	other (specify)

Other:

	Sample Identification	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	903.0 904.0	6020A, 7470A	Nitrate_Calc, SM4500_NO3_F	2540C 4500_F_C 9038 9251, SM4500_NO2_B	9014 - Cyanide, Total											Total Number of containers	Special Instructions/Note:
				Preservation Code				D	D	S	N	B												
1	MW-01	5/23/22	1059	G	W	N	N	X	X	X	X	X												Short Hold-NO_2 (48 HR)
2	MW-02	5/23/22	1153	G	W	N	N																	
3	MW-03	5/23/22	1245	G	W	N	N																	
4	MW-04	5/23/22	1357	G	W	N	N																	
5	Duplicate	5/23/22	—	G	W	N	N																	

Possible Hazard Identification
☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐ Radiological

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return To Client ☐ Disposal By Lab ☐ Archive For _____ Months

Deliverable Requested I II III IV Other (specify)

Special Instructions/QC Requirements

Empty Kit Relinquished by	Date	Time	Method of Shipment:

	Relinquished by	Date/Time	Company	Received by	Date/Time	Company
1	MPD	5/23/22 / 1700	KPRG	FEDEX	5/23/22 / 1700	FEDEX
2				Stephanie Hernandez	5/24/22 0915	EEIA
3						

Custody Seals Intact. Δ Yes Δ No	Custody Seal No	Cooler Temperature(s) °C and Other Remarks	10+0 5.3 1+1.4

Ver 01/16/2019
6/24/2022

Electronic Filing: Received, Clerk's Office 10/31/2022

Eurofins TestAmerica, Chicago
2417 Bond Street
University Park IL 60484
Phone (708) 534 5200 Phone (708) 534-5211

Chain of Custody Record

eurofins | environment testing America

Client Information	Sampler: Kaelyn Sperle & Mitchel Dolan	Lab PM: Mockler Diana J	Carrier Tracking No(s):	COC No: 500-96049-42473 1
Client Contact: Mitchel Dolan	Phone: 262-781-0475	E-Mail: Diana.Mockler@Eurofinset.com	State of Origin: IL	Page: Page 1 of 1
Company: KPRG and Associates Inc	PWSID:	Analysis Requested		Job #: 500-217043
Address: 14665 West Lisbon Road Suite 1A	Due Date Requested:			Preservation Codes: A HCL, B NaOH, C Zn Acetate, D Nitric Acid, E NaHSO4, F MeOH, G Amchlor, H Ascorbic Acid, I Ice, J DI Water, K EDTA, L EDA, M Hexane, N None, O AsNaO2, P Na2O4S, Q Na2SO3, R Na2S2O3, S H2SO4, T TSP Dodecahydrate, U Acetone, V MCAA, W pH 4-5, Z other (specify); Other:
City: Brookfield	TAT Requested (days):			
State, Zip: WI 53005	Compliance Project: Δ Yes Δ No			
Phone: 262 781-0475(Tel)	PO #: 4502012555			
Email: mitchelD@kprginc com	WO #:			
Project Name: Waukegan Station Permit	Project #: 50004763			
Site: Illinois	SSOW#:			

| | Sample Identification | Sample Date | Sample Time | Sample Type (C=Comp, G=grab) | Matrix (W=water S=solid O=waste/oil, BT=Tissue A=Air) | Field Filtered Sample (Yes or No) | Perform MS/MSD (Yes or No) | 903.0 904.0 | 6020A, 7470A | Nitrate_Calc, SM4500_NO3_F | 2540C 4500_F_C, 9038 9251 SM4500_NO2_B | 9014 - Cyanide Total | | |

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Chain of Custody Record

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Client Information	Sampler: Kaelyn Sperle & Mitchel Dolan	Lab PM: Mockler Diana J	Carrier Tracking No(s):	COC No: 500-96049-42473 1
Client Contact: Mitchel Dolan	Phone: 262-781-0475	E-Mail: Diana.Mockler@Eurofinset.com	State of Origin: IL	Page: Page 1 of 1
Company: KPRG and Associates Inc	PWSID:	Analysis Requested		Job #: 500 217043
Address: 14665 West Lisbon Road Suite 1A	Due Date Requested:			Preservation Codes: A HCL, B NaOH, C Zn Acetate, D Nitric Acid, E NaHSO4, F MeOH, G Amchlor, H Ascorbic Acid, I Ice, J DI Water, K EDTA, L EDA, M Hexane, N None, O AsNaO2, P Na2O4S, Q Na2SO3, R Na2S2O3, S H2SO4, T TSP Dodecahydrate, U Acetone, V MCAA, W pH 4-5, Z other (specify); Other
City: Brookfield	TAT Requested (days):			
State, Zip: WI 53005	Compliance Project: Δ Yes Δ No			
Phone: 262 781-0475(Tel)	PO #: 4502012555			
Email: mitcheld@kprginc.com	WO #:			
Project Name: Waukegan Station Permit	Project #: 50004763			
Site: Illinois	SSOW#:			

	Sample Identification	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	903.0 904.0	6020A, 7470A	Nitrate_Calc SM4500_NO3_F	2540C 4500_F_C, 9038 9251, SM4500_NO2_B	9014 - Cyanide Total	Total Number of containers	Special Instructions/Note.
				Preservation Code				D	D	S	N	B		
9	MW-08	5/24/22	1428	G	W	N	N	X	X	X	X	X		
10	MW-09	5/24/22	1110	G	W	N	N	↓	↓	↓	↓	↓		

Possible Hazard Identification
☐ Non Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐ Radiological

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return To Client ☐ Disposal By Lab ☐ Archive For _____ Months

Deliverable Requested I II III IV Other (specify)

Special Instructions/QC Requirements

Empty Kit Relinquished by	Date	Time	Method of Shipment

	Relinquished by	Date/Time	Company	Received by	Date/Time	Company
1	Kaelyn Sperle	5/24/22 1700	KPRG	FedEx	5/24/22 1700	FedEx
2				Stephanie Hernandez	5/25/22 0940	EEIA
3						

Custody Seals Intact: Δ Yes Δ No	Custody Seal No	Cooler Temperature(s) °C and Other Remarks: 1.1+0.6

Ver: 01/16/2019

6/24/2022

Electronic Filing: Received, Clerk's Office 10/31/2022

Eurofins TestAmerica, Chicago
2417 Bond Street
University Park IL 60484
Phone (708) 534-5200 Phone (708) 534-5211

Chain of Custody Record

eurofins | Environment Testing America

Client Information	Sampler: Kaelyn Sperle & Mitchel Dolan	Lab PM: Mockler Diana J	Carrier Tracking No(s):	COC No: 500-96049-42473 1
Client Contact: Mitchel Dolan	Phone: 262-781-0475	E Mail: Diana.Mockler@Eurofinset.com	State of Origin: IL	Page: Page 1 of 1
Company: KPRG and Associates Inc	PWSID:	Analysis Requested		Job #: 500-217043
Address: 14665 West Lisbon Road Suite 1A	Due Date Requested:			Preservation Codes: A HCL, B NaOH, C Zn Acetate, D Nitric Acid, E NaHSO4, F MeOH, G Amchlor, H Ascorbic Acid, I Ice, J DI Water, K EDTA, L EDA, M Hexane, N None, O AsNaO2, P Na2O4S, Q Na2SO3, R Na2S2O3, S H2SO4, T TSP Dodecahydrate, U Acetone, V MCAA, W pH 4-5, Z other (specify), Other:
City: Brookfield	TAT Requested (days):			
State, Zip: WI 53005	Compliance Project: ∆ Yes ∆ No			
Phone: 262 781-0475(Tel)	PO #: 4502012555			
Email: mitcheld@kprginc com	WO #:			
Project Name: Waukegan Station Permit	Project #: 50004763			
Site: Illinois	SSOW#:			

	Sample Identification	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water S=solid, O=waste/oil, BT=Tissue A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	903.0 904.0	6020A, 7470A	Nitrate_Calc, SM4500_NO3_F	2540C, 4500_F_C 9038 9251 SM4500_NO2_B	9014 - Cyanide Total	Total Number of containers	Special Instructions/Note:
				Preservation Code				D	D	S	N	B		
11	MW-11 ELUC	5/24/22	0910	G	W	N	N	X	X	X	X	X		
12	MW-14 ELUC	5/24/22	1008	G	W	N	N	↓	↓	↓	↓	↓		
13	MW-15 ELUC	5/24/22	~~0915~~	G	W	N	N	↓	↓	↓	↓	↓		

Possible Hazard Identification: ☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐ Radiological

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): ☐ Return To Client ☐ Disposal By Lab ☐ Archive For _____ Months

Deliverable Requested I II III IV Other (specify)

Special Instructions/QC Requirements

Empty Kit Relinquished by	Date	Time	Method of Shipment

	Relinquished by	Date/Time	Company	Received by	Date/Time	Company
1	Kaelyn Sperle	5/24/22 1700	KPRG	FedEx	5/24/22 1700	FedEx
2	Relinquished by	Date/Time	Company	Received by: Stephanie Hernandez	Date/Time 5/25/22 0940	Company EEIA
3	Relinquished by	Date/Time	Company	Received by	Date/Time	Company

Custody Seals Intact: ∆ Yes ∆ No	Custody Seal No	Cooler Temperature(s) °C and Other Remarks: 2.4+1.0

Electronic Filing: Received, Clerk's Office 10/31/2022

Eurofins TestAmerica, Chicago
2417 Bond Street
University Park IL 60484
Phone (708) 534-5200 Phone (708) 534-5211

Chain of Custody Record

eurofins | Environment Testing America

Client Information	Sampler: Kaelyn Spurck & Mitchel Dolan	Lab PM: Mockler Diana J	Carrier Tracking No(s):	COC No: 500-96049-42473 1
Client Contact: Mitchel Dolan	Phone: 262-781-0475	E-Mail: Diana.Mockler@Eurofinset.com	State of Origin: IL	Page: Page 1 of 1
Company: KPRG and Associates Inc	PWSID:	Analysis Requested		Job #: 500-217043
Address: 14665 West Lisbon Road Suite 1A	Due Date Requested:			Preservation Codes: A HCL, B NaOH, C Zn Acetate, D Nitric Acid, E NaHSO4, F MeOH, G Amchlor, H Ascorbic Acid, I Ice, J DI Water, K EDTA, L EDA, M Hexane, N None, O AsNaO2, P Na2O4S, Q Na2SO3, R Na2S2O3, S H2SO4, T TSP Dodecahydrate, U Acetone, V MCAA, W pH 4-5, Z other (specify)
City: Brookfield	TAT Requested (days):			
State, Zip: WI 53005	Compliance Project: Δ Yes Δ No			
Phone: 262 781-0475(Tel)	PO #: 4502012555			
Email: mitchold@kprginc com	WO #:			
Project Name: Waukegan Station Permit	Project #: 50004763			
Site: Illinois	SSOW#:			

500-217043 COC

	Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	903.0, 904.0	6020A, 7470A	Nitrate_Calc, SM4500_NO3_F	2540C, 4500_F_C, 9038, 9251, SM4500_NO2_B	9014 - Cyanide, Total	Total Number of containers	Special Instructions/Note.
				Preservation Code:				D	D	S	N	B		
14	MW-10 ELUC	5/25/22	0922	G	W	N	N	X	X	X	X	X		
15	MW-12 ELUC	5/25/22	1003	G	W	N	N	X	X	X	X	X		

Possible Hazard Identification
☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐ Radiological

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return To Client ☐ Disposal By Lab ☐ Archive For _____ Months

Deliverable Requested I II III IV Other (specify)

Special Instructions/QC Requirements

Empty Kit Relinquished by	Date	Time	Method of Shipment.

	Relinquished by	Date/Time	Company	Received by	Date/Time	Company
1	Kaelyn Spurck	5/25/22 1200	KPRG	FedEx	5/25/22 1200	FedEx
2	Relinquished by:	Date/Time	Company	Received by: Stephanie Hemandez	5/26/22 0925	EFTA
3	Relinquished by:	Date/Time	Company	Received by:	Date/Time	Company

Custody Seals Intact: Δ Yes Δ No	Custody Seal No	Cooler Temperature(s) °C and Other Remarks: 1.5+1.0

Ver 01/16/2019

6/24/2022

Electronic Filing: Received, Clerk's Office 10/31/2022

ORIGIN ID:FEPA (262) 622-1143
MITCHELL DOLAN
KPRG AND ASSOCIATES
414 PLAZA DR STE 106

WESTMONT, IL 60559
UNITED STATES US

SHIP DATE: 23MAY22
ACTWGT: 61.80 LB
CAD: 6994083/SSFE2300
DIMS: 24x14x10 IN

BILL THIRD PARTY

TO TEST AMERICA
TEST AMERICA
2417 BOND ST
201
UNIVERSITY PARK "
(708) 534-6200
INV:
PO:

RT 519 ST 21
5 16:30 A 8130 05 24

FedEx Express
REL# 3788346

2 of 2
MPS# 0263 2734 6308 8130
Mstr# 2734 6308 8120
0201

TUE - 24 MAY 4:30P
STANDARD OVERNIGHT
AHS
60484
IL-US ORD

79 JOTA

Part # 156293435 REV EXP 01/23

ORIGIN ID:FEPA (262) 622-1143
MITCHELL DOLAN
KPRG AND ASSOCIATES
414 PLAZA DR STE 106

WESTMONT, IL 60559
UNITED STATES US

SHIP DATE: 23MAY22
ACTWGT: 61.80 LB
CAD: 6994083/SSFE2300
DIMS: 24x14x10 IN

BILL THIRD PARTY

TO TEST AMERICA
TEST AMERICA
2417 BOND ST
201
UNIVERSITY PARK IL 60484
(708) 534-6200
INV:
PO:
REF:
DEPT:

500-217043 Waybi

FedEx Express
REL# 3788346

1 of 2
TRK# 0201 2734 6308 8120
MASTER

TUE - 24 MAY 4:30P
STANDARD OVERNIGHT
AHS
60484
IL-US ORD

79 JOTA

Part # 156293435

Electronic Filing: Received, Clerk's Office 10/31/2022

ORIGIN ID:FEPA (262) 622-1143
MITCHELL DOLAN
KPRG AND ASSOCIATES
414 PLAZA DR STE 106

WESTMONT, IL 60559
UNITED STATES US

SHIP DATE: 24MAY22
ACTWGT: 56.30 LB
CAD: 6994083/SSFE2300
DIMS: 24x13x13 IN

BILL THIRD PARTY

Part # 156297-435 RRDBF EXP 01/23

TO TEST AMERICA
TEST AMERICA
2417 BOND ST
201
UNIVERSITY PARK IL 60484
(708) 534-6200

REF:
INV:
PO:
DEPT:

FedEx Express

REL# 3785346

2 of 3
MPS# 0263 2735 1248 8898
Mstr# 2735 1248 8887

WED - 25 MAY 4:30P
STANDARD OVERNIGHT
0201
AHS
60484
IL-US ORD

79 JOTA

ORIGIN ID:FEPA (262) 622-1143
MITCHELL DOLAN
KPRG AND ASSOCIATES
414 PLAZA DR STE 106

WESTMONT, IL 60559
UNITED STATES US

SHIP DATE: 24MAY22
ACTWGT: 56.30 LB
CAD: 6994083/SSFE2300
DIMS: 24x13x13 IN

BILL THIRD PARTY

Part # 156297-435 RRDBF EXP 01/23

TO TEST AMERICA
TEST AMERICA
2417 BOND ST
201
UNIVERSITY PARK IL 60484
(708) 534-6200

500-217043 Waybi

REF:
INV:
PO:
DEPT:

FedEx Express

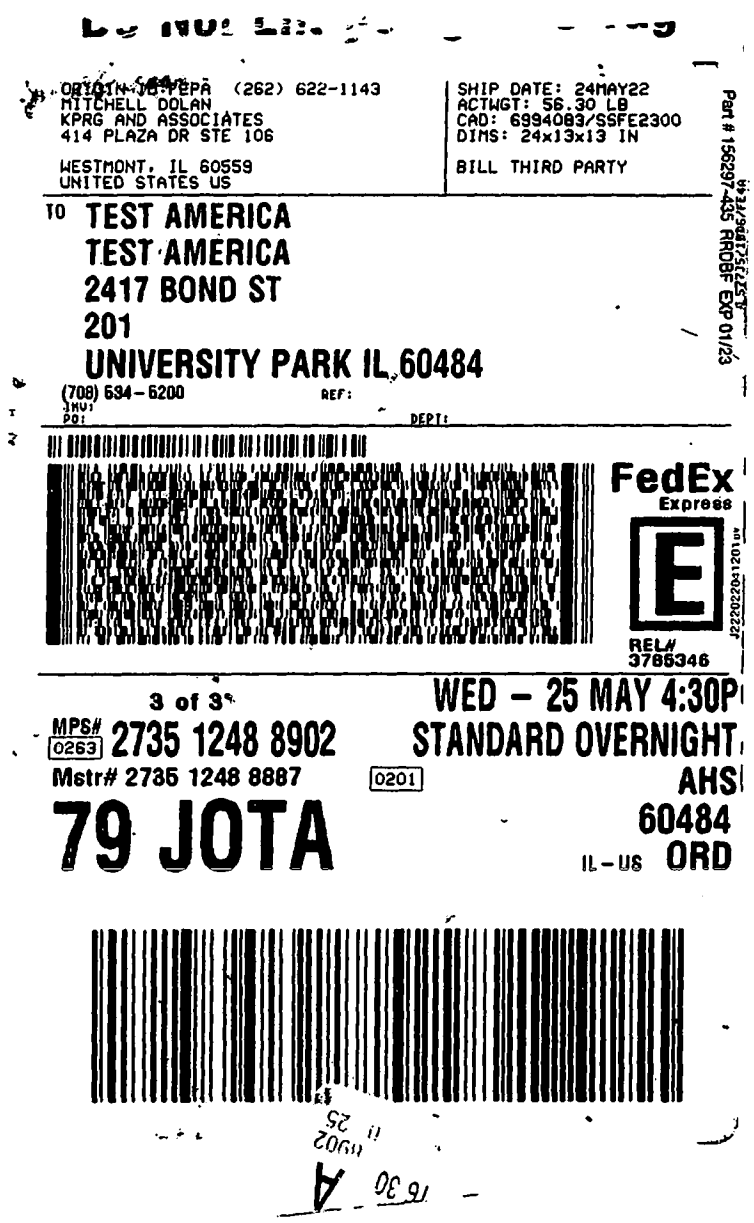
REL# 3785346

1 of 3
TRK# 0201 2735 1248 8[illegible]
MASTER

[illegible] - 25 MAY 4:30P
[illegible]RNIGHT
AHS
60484
US ORD

79 JOTA

Electronic Filing: Received, Clerk's Office 10/31/2022



ORIGIN ID:PEPA (262) 622-1143
MITCHELL DOLAN
KPRG AND ASSOCIATES
414 PLAZA DR STE 106

WESTMONT, IL 60559
UNITED STATES US

SHIP DATE: 24MAY22
ACTWGT: 56.30 LB
CAD: 6994083/SSFE2300
DIMS: 24x13x13 IN

BILL THIRD PARTY

Part # 156297-435 RRDBF EXP 01/23

TO TEST AMERICA
TEST AMERICA
2417 BOND ST
201
UNIVERSITY PARK IL 60484
(708) 534-6200 REF:
INV:
PO: DEPT:

FedEx Express

REL# 3786346

3 of 3

WED - 25 MAY 4:30P
STANDARD OVERNIGHT

MPS# 0263 2735 1248 8902
Mstr# 2735 1248 8887 0201

AHS
60484
IL-US ORD

79 JOTA

Electronic Filing: Received, Clerk's Office 10/31/2022

500-217043 Waybi

ORIGIN ID:FEPA (630) 325-1300

KPRG AND ASSOCIATES
414 PLAZA DR STE 106

WESTMONT, IL 60559
UNITED STATES US

SHIP DATE: 25MAY22
ACTWGT: 50.40 LB
CAD: 6994084/SSFE2300
DIMS: 23x13x12 IN

BILL THIRD PARTY

Part # 1[illegible] REV EXP 01/23

10 TEST AMERICA
C/O SAMPLE & RECEIVING
2417 BOND ST
SUITE 201
UNIVERSITY PARK IL 60484

(708) 534-6200 REF:
INV:
PO: DEPT:

FedEx Express

REL# 3785346

THU - 26 MAY 10:30A
PRIORITY OVERNIGHT

TRK# 0201 2735 4029 3700

79 JOTA

60484
IL-US ORD

Electronic Filing: Received, Clerk's Office 10/31/2022

Eurofins Chicago
2417 Bond Street
University Park, IL 60484
Phone: 708-534-5200 Fax: 708-534-5211

Chain of Custody Record

eurofins | Environment Testing America

Client Information (Sub Contract Lab)	Sampler:	Lab PM: Mockler, Diana J	Carrier Tracking No(s):	COC No: 500-161064.1
Client Contact: Shipping/Receiving	Phone:	E-Mail: Diana.Mockler@et.eurofinsus.com	State of Origin: Illinois	Page: Page 1 of 1
Company: TestAmerica Laboratories, Inc.		Accreditations Required (See note): NELAP - Illinois		Job #: 500-217043-2
Address: 13715 Rider Trail North,	Due Date Requested: 6/7/2022			
City: Earth City	TAT Requested (days):			
State, Zip: MO, 63045				
Phone: 314-298-8566(Tel) 314-298-8757(Fax)	PO #:			
Email:	WO #:			
Project Name: Waukegan Station Permit	Project #: 50004763			
Site: NRG Midwest Generation Waukegan	SSOW#:			

Analysis Requested

Preservation Codes:
A - HCL, B - NaOH, C - Zn Acetate, D - Nitric Acid, E - NaHSO4, F - MeOH, G - Amchlor, H - Ascorbic Acid, I - Ice, J - DI Water, K - EDTA, L - EDA, M - Hexane, N - None, O - AsNaO2, P - Na2O4S, Q - Na2SO3, R - Na2S2O3, S - H2SO4, T - TSP Dodecahydrate, U - Acetone, V - MCAA, W - pH 4-5, Y - Trizma, Z - other (specify)
Other:

Sample Identification - Client ID (Lab ID)	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	903.0/PrecSep_21 Standard Target List	904.0/ProcSep_0 Standard Target List	Total Number of containers	Special Instructions/Note:
			Preservation Code:							
MW-01 (500-217043-1)	5/23/22	10:59 Central		Water			X	X	3	Batch QC must be performed (dup, spikes, etc) - no NCMs concerning limited volume;
MW-02 (500-217043-2)	5/23/22	11:53 Central		Water			X	X	3	Batch QC must be performed (dup, spikes, etc) - no NCMs concerning limited volume;
MW-03 (500-217043-3)	5/23/22	12:45 Central		Water			X	X	3	Batch QC must be performed (dup, spikes, etc) - no NCMs concerning limited volume;
MW-04 (500-217043-4)	5/23/22	13:57 Central		Water			X	X	3	Batch QC must be performed (dup, spikes, etc) - no NCMs concerning limited volume;
Duplicate (500-217043-5)	5/23/22	Central		Water			X	X	3	Batch QC must be performed (dup, spikes, etc) - no NCMs concerning limited volume;

Note: Since laboratory accreditations are subject to change, Eurofins Chicago places the ownership of method, analyte & accreditation compliance upon out subcontract laboratories. This sample shipment is forwarded under chain-of-custody. If the laboratory does not currently maintain accreditation in the State of Origin listed above for analysis/tests/matrix being analyzed, the samples must be shipped back to the Eurofins Chicago laboratory or other instructions will be provided. Any changes to accreditation status should be brought to Eurofins Chicago attention immediately. If all requested accreditations are current to date, return the signed Chain of Custody attesting to said complicance to Eurofins Chicago.

Possible Hazard Identification	*Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)*
Unconfirmed	☐ *Return To Client* ☐ *Disposal By Lab* ☐ *Archive For* ____ *Months*
Deliverable Requested: I, II, III, IV, Other (specify) Primary Deliverable Rank: 2	Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:

	Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
1	[signature]	5/24/22 1120	[illegible]	FED EX		
2	FED EX			[signature]	MAY 25 2022 0900	EAST
3						

Custody Seals Intact: ∆ Yes ∆ No	Custody Seal No.:	Cooler Temperature(s) °C and Other Remarks:

Page 24 of 36

6/24/2022

Electronic Filing: Received, Clerk's Office 10/31/2022

Eurofins Chicago
2417 Bond Street
University Park, IL 60484
Phone: 708-534-5200 Fax: 708-534-5211

Chain of Custody Record

eurofins Environment Testing America

Client Information (Sub Contract Lab)	Sampler:	Lab PM: Mockler, Diana J	Carrier Tracking No(s):	COC No: 500-161170.1
Client Contact: Shipping/Receiving	Phone:	E-Mail: Diana.Mockler@et.eurofinsus.com	State of Origin: Illinois	Page: Page 1 of 1
Company: TestAmerica Laboratories, Inc.		Accreditations Required (See note): NELAP - Illinois		Job #: 500-217043-1
Address: 13715 Rider Trail North, .	Due Date Requested: 6/7/2022			
City: Earth City	TAT Requested (days):			
State, Zip: MO, 63045				
Phone: 314-298-8566(Tel) 314-298-8757(Fax)	PO #:			
Email:	WO #:			
Project Name: Waukegan Station Permit	Project #: 50004763			
Site: NRG Midwest Generation Waukegan	SSOW#:			

Analysis Requested

Preservation Codes:
A - HCL; B - NaOH; C - Zn Acetate; D - Nitric Acid; E - NaHSO4; F - MeOH; G - Amchlor; H - Ascorbic Acid; I - Ice; J - DI Water; K - EDTA; L - EDA; M - Hexane; N - None; O - AsNaO2; P - Na2O4S; Q - Na2SO3; R - Na2S2O3; S - H2SO4; T - TSP Dodecahydrate; U - Acetone; V - MCAA; W - pH 4-5; Y - Trizma; Z - other (specify); Other:

Sample Identification - Client ID (Lab ID)	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	903.0/PrecSep_21 Standard Target List	904.0/PrecSep_0 Standard Target List	Total Number of containers	Special Instructions/Note:
			Preservation Code:							
MW-05 (500-217043-6)	5/24/22	12:11 Central		Water			X	X	3	Batch QC must be performed (dup, spikes, etc) - no NCMs concerning limited volume;
MW-06 (500-217043-7)	5/24/22	13:40 Central		Water			X	X	3	Batch QC must be performed (dup, spikes, etc) - no NCMs concerning limited volume;
MW-07 (500-217043-8)	5/24/22	13:01 Central		Water			X	X	3	Batch QC must be performed (dup, spikes, etc) - no NCMs concerning limited volume;

Note: Since laboratory accreditations are subject to change, Eurofins Chicago places the ownership of method, analyte & accreditation compliance upon out subcontract laboratories. This sample shipment is forwarded under chain-of-custody. If the laboratory does not currently maintain accreditation in the State of Origin listed above for analysis/tests/matrix being analyzed, the samples must be shipped back to the Eurofins Chicago laboratory or other instructions will be provided. Any changes to accreditation status should be brought to Eurofins Chicago attention immediately. If all requested accreditations are current to date, return the signed Chain of Custody attesting to said complicance to Eurofins Chicago.

Possible Hazard Identification: Unconfirmed	Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): ☐ Return To Client ☐ Disposal By Lab ☐ Archive For ____ Months
Deliverable Requested: I, II, III, IV, Other (specify) Primary Deliverable Rank: 2	Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:
Relinquished by: [signature]	Date/Time: 5/25/22 1630	Company: EETN	Received by: FED EX
Relinquished by: FED EX	Date/Time:	Company	Received by: Jena Worthington
Relinquished by:	Date/Time:	Company	Received by:

Date/Time:	Company
MAY 26 2022 0900	ETNSL
Date/Time:	Company

Custody Seals Intact: ∆ Yes ∆ No	Custody Seal No.:	Cooler Temperature(s) °C and Other Remarks:

Electronic Filing: Received, Clerk's Office 10/31/2022

Eurofins Chicago
2417 Bond Street
University Park, IL 60484
Phone: 708-534-5200 Fax: 708-534-5211

Chain of Custody Record

eurofins Environment Testing America

Client Information (Sub Contract Lab)	Sampler:	Lab PM: Mockler, Diana J	Carrier Tracking No(s):	COC No: 500-161170.1
Client Contact: Shipping/Receiving	Phone:	E-Mail: Diana.Mockler@et.eurofinsus.com	State of Origin: Illinois	Page: Page 1 of 1
Company: TestAmerica Laboratories, Inc.		Accreditations Required (See note): NELAP - Illinois		Job #: 500-217043-5
Address: 13715 Rider Trail North, .	Due Date Requested: 6/28/2022			
City: Earth City	TAT Requested (days):			
State, Zip: MO, 63045				
Phone: 314-298-8566(Tel) 314-298-8757(Fax)	PO #:			
Email:	WO #:			
Project Name: Waukegan Station Permit	Project #: 50004763			
Site: NRG Midwest Generation Waukegan	SSOW#:			

Analysis Requested

Preservation Codes:
A - HCL, B - NaOH, C - Zn Acetate, D - Nitric Acid, E - NaHSO4, F - MeOH, G - Amchlor, H - Ascorbic Acid, I - Ice, J - DI Water, K - EDTA, L - EDA, M - Hexane, N - None, O - AsNaO2, P - Na2O4S, Q - Na2SO3, R - Na2S2O3, S - H2SO4, T - TSP Dodecahydrate, U - Acetone, V - MCAA, W - pH 4-5, Y - Trizma, Z - other (specify), Other:

Sample Identification - Client ID (Lab ID)	Sample Date	Sample Time	Sample Type (C=Comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	903.0/PrecSep_21 Standard Target List	904.0/PrecSep_0 Standard Target List	Total Number of containers	Special Instructions/Note:
			Preservation Code:		X	X			X	
MW-08 (500-217043-9)	5/24/22	14:28 Central		Water			X	X	3	Batch QC must be performed (dup, spikes, etc) - no NCMs concerning limited volume;
MW-09 (500-217043-10)	5/24/22	11:10 Central		Water			X	X	3	Batch QC must be performed (dup, spikes, etc) - no NCMs concerning limited volume;

Note: Since laboratory accreditations are subject to change, Eurofins Chicago places the ownership of method, analyte & accreditation compliance upon out subcontract laboratories. This sample shipment is forwarded under chain-of-custody. If the laboratory does not currently maintain accreditation in the State of Origin listed above for analysis/tests/matrix being analyzed, the samples must be shipped back to the Eurofins Chicago laboratory or other instructions will be provided. Any changes to accreditation status should be brought to Eurofins Chicago attention immediately. If all requested accreditations are current to date, return the signed Chain of Custody attesting to said complicance to Eurofins Chicago.

Possible Hazard Identification	*Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)*
Unconfirmed	☐ *Return To Client* ☐ *Disposal By Lab* ☐ *Archive For* ____ *Months*
Deliverable Requested: I, II, III, IV, Other (specify) Primary Deliverable Rank: 2	Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:

	Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
1	[signature]	5/25/22 1430	EETA	FED EX		
2	FED EX			[signature] Sierra Worthington	MAY 26 2022 0900	CTMSL
3						

Custody Seals Intact: ☐ Yes ☐ No	Custody Seal No.:	Cooler Temperature(s) °C and Other Remarks:

6/24/2022

Electronic Filing: Received, Clerk's Office 10/31/2022

Eurofins Chicago
2417 Bond Street
University Park, IL 60484
Phone: 708-534-5200 Fax: 708-534-5211

Chain of Custody Record

eurofins | Environment Testing America

Client Information (Sub Contract Lab)	Sampler:	Lab PM: Mockler, Diana J	Carrier Tracking No(s):	COC No: 500-161170.1
Client Contact: Shipping/Receiving	Phone:	E-Mail: Diana.Mockler@et.eurofinsus.com	State of Origin: Illinois	Page: Page 1 of 1
Company: TestAmerica Laboratories, Inc.		Accreditations Required (See note): NELAP - Illinois		Job #: 500-217043-6
Address: 13715 Rider Trail North,	Due Date Requested: 6/7/2022			
City: Earth City	TAT Requested (days):			
State, Zip: MO, 63045				
Phone: 314-298-8566(Tel) 314-298-8757(Fax)	PO #:			
Email:	WO #:			
Project Name: Waukegan Station Permit	Project #: 50004763			
Site: NRG Midwest Generation Waukegan	SSOW#:			

Preservation Codes:
A - HCL, B - NaOH, C - Zn Acetate, D - Nitric Acid, E - NaHSO4, F - MeOH, G - Amchlor, H - Ascorbic Acid, I - Ice, J - DI Water, K - EDTA, L - EDA, M - Hexane, N - None, O - AsNaO2, P - Na2O4S, Q - Na2SO3, R - Na2S2O3, S - H2SO4, T - TSP Dodecahydrate, U - Acetone, V - MCAA, W - pH 4-5, Y - Trizma, Z - other (specify), Other:

Sample Identification - Client ID (Lab ID)	Sample Date	Sample Time	Sample Type (C=Comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	903.0/PrecSep_21 Standard Target List	904.0/PrecSep_0 Standard Target List	Total Number of containers	Special Instructions/Note:
			Preservation Code:							
ELUC MW-11 (500-217043-11)	5/24/22	09:10 Central		Water			X	X	3	Batch QC must be performed (dup, spikes, etc) - no NCMs concerning limited volume;
ELUC MW-14 (500-217043-12)	5/24/22	10:08 Central		Water			X	X	3	Batch QC must be performed (dup, spikes, etc) - no NCMs concerning limited volume;
ELUC MW-15 (500-217043-13)	5/24/22	15:12 Central		Water			X	X	3	Batch QC must be performed (dup, spikes, etc) - no NCMs concerning limited volume;

Note: Since laboratory accreditations are subject to change, Eurofins Chicago places the ownership of method, analyte & accreditation compliance upon out subcontract laboratories. This sample shipment is forwarded under chain-of-custody. If the laboratory does not currently maintain accreditation in the State of Origin listed above for analysis/tests/matrix being analyzed, the samples must be shipped back to the Eurofins Chicago laboratory or other instructions will be provided. Any changes to accreditation status should be brought to Eurofins Chicago attention immediately. If all requested accreditations are current to date, return the signed Chain of Custody attesting to said complicance to Eurofins Chicago.

Possible Hazard Identification	Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
Unconfirmed	☐ Return To Client ☐ Disposal By Lab ☐ Archive For ____ Months
Deliverable Requested: I, II, III, IV, Other (specify) Primary Deliverable Rank: 2	Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:

	Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
1	[signature] FED EX	5/25/22 1430	ERTA	FED EX		
2	Relinquished by:	Date/Time:	Company	Received by: Sierra Worthington	MAY 26 2022 0900	ETMSR
3	Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company

Custody Seals Intact: △ Yes △ No	Custody Seal No.:	Cooler Temperature(s) °C and Other Remarks:

Electronic Filing: Received, Clerk's Office 10/31/2022

Eurofins Chicago
2417 Bond Street
University Park, IL 60484
Phone: 708-534-5200 Fax: 708-534-5211

Chain of Custody Record

eurofins Environment Testing America

Client Information (Sub Contract Lab)	Sampler:	Lab PM: Mockler, Diana J	Carrier Tracking No(s):	COC No: 500-161232.1
Client Contact: Shipping/Receiving	Phone:	E-Mail: Diana.Mockler@et.eurofinsus.com	State of Origin: Illinois	Page: Page 1 of 1
Company: TestAmerica Laboratories, Inc.		Accreditations Required (See note): NELAP - Illinois		Job #: 500-217043-6
Address: 13715 Rider Trail North,	Due Date Requested: 6/8/2022			
City: Earth City	TAT Requested (days):			
State, Zip: MO, 63045				
Phone: 314-298-8566(Tel) 314-298-8757(Fax)	PO #:			
Email:	WO #:			
Project Name: Waukegan Station Permit	Project #: 50004763			
Site: NRG Midwest Generation Waukegan	SSOW#:			

Analysis Requested

Sample Identification - Client ID (Lab ID)	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	903.0/PrecSep_21 Standard Target List	904.0/PrecSep_0 Standard Target List	Total Number of containers	Special Instructions/Note:
			Preservation Code:							
ELUC MW-10 (500-217043-14)	5/25/22	09:22 Central		Water			X	X	3	Batch QC must be performed (dup, spikes, etc) - no NCMs concerning limited volume;
ELUC MW-12 (500-217043-15)	5/25/22	10:03 Central		Water			X	X	3	Batch QC must be performed (dup, spikes, etc) - no NCMs concerning limited volume;

Preservation Codes:
A - HCL, B - NaOH, C - Zn Acetate, D - Nitric Acid, E - NaHSO4, F - MeOH, G - Amchlor, H - Ascorbic Acid, I - Ice, J - DI Water, K - EDTA, L - EDA, M - Hexane, N - None, O - AsNaO2, P - Na2O4S, Q - Na2SO3, R - Na2S2O3, S - H2SO4, T - TSP Dodecahydrate, U - Acetone, V - MCAA, W - pH 4-5, Y - Trizma, Z - other (specify), Other:

Note: Since laboratory accreditations are subject to change, Eurofins Chicago places the ownership of method, analyte & accreditation compliance upon out subcontract laboratories. This sample shipment is forwarded under chain-of-custody. If the laboratory does not currently maintain accreditation in the State of Origin listed above for analysis/tests/matrix being analyzed, the samples must be shipped back to the Eurofins Chicago laboratory or other instructions will be provided. Any changes to accreditation status should be brought to Eurofins Chicago attention immediately. If all requested accreditations are current to date, return the signed Chain of Custody attesting to said complicance to Eurofins Chicago.

Possible Hazard Identification: Unconfirmed	Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): ☐ Return To Client ☐ Disposal By Lab ☐ Archive For ____ Months
Deliverable Requested: I, II, III, IV, Other (specify) Primary Deliverable Rank: 2	Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:

	Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
1	Shirin Scott	5/26/22 1315	EETA	FED EX		
2	FED EX			Sierra Worthington	MAY 27 2022 1230	EETSL
3						

Custody Seals Intact: Δ Yes Δ No	Custody Seal No.:	Cooler Temperature(s) °C and Other Remarks:

6/24/2022

Electronic Filing: Received, Clerk's Office 10/31/2022

Login Sample Receipt Checklist

Client: KPRG and Associates, Inc.

Job Number: 500-217043-2

Login Number: 217043
List Number: 1
Creator: Hernandez, Stephanie

List Source: Eurofins Chicago

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	0.5,1.4,1.1,0.6,1.0,1.0
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	N/A	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Login Sample Receipt Checklist

Client: KPRG and Associates, Inc.

Job Number: 500-217043-2

Login Number: 217043
List Number: 2
Creator: Booker, Autumn R

List Source: Eurofins St. Louis
List Creation: 05/25/22 03:27 PM

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	N/A	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Login Sample Receipt Checklist

Client: KPRG and Associates, Inc.

Job Number: 500-217043-2

Login Number: 217043
List Number: 3
Creator: Worthington, Sierra M

List Source: Eurofins St. Louis
List Creation: 05/26/22 11:32 AM

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Login Sample Receipt Checklist

Client: KPRG and Associates, Inc.

Job Number: 500-217043-2

Login Number: 217043
List Number: 4
Creator: Worthington, Sierra M

List Source: Eurofins St. Louis
List Creation: 05/27/22 02:36 PM

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	N/A	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Lab Chronicle

Client: KPRG and Associates, Inc.
Project/Site: Waukegan Station Permit (RAD)

Job ID: 500-217043-2

Client Sample ID: MW-01

Lab Sample ID: 500-217043-1
Matrix: Water
Date Collected: 05/23/22 10:59
Date Received: 05/24/22 09:15

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	PrecSep-21			567407	05/26/22 10:39	MS	TAL SL
Total/NA	Analysis	903.0		1	570475	06/17/22 08:37	CLP	TAL SL
Total/NA	Prep	PrecSep_0			567410	05/26/22 10:58	MS	TAL SL
Total/NA	Analysis	904.0		1	570137	06/15/22 11:36	FLC	TAL SL

Client Sample ID: MW-02

Lab Sample ID: 500-217043-2
Matrix: Water
Date Collected: 05/23/22 11:53
Date Received: 05/24/22 09:15

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	PrecSep-21			567407	05/26/22 10:39	MS	TAL SL
Total/NA	Analysis	903.0		1	570475	06/17/22 08:37	CLP	TAL SL
Total/NA	Prep	PrecSep_0			567410	05/26/22 10:58	MS	TAL SL
Total/NA	Analysis	904.0		1	570137	06/15/22 11:36	FLC	TAL SL

Client Sample ID: MW-03

Lab Sample ID: 500-217043-3
Matrix: Water
Date Collected: 05/23/22 12:45
Date Received: 05/24/22 09:15

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	PrecSep-21			567407	05/26/22 10:39	MS	TAL SL
Total/NA	Analysis	903.0		1	570475	06/17/22 08:38	CLP	TAL SL
Total/NA	Prep	PrecSep_0			567410	05/26/22 10:58	MS	TAL SL
Total/NA	Analysis	904.0		1	570137	06/15/22 11:37	FLC	TAL SL

Client Sample ID: MW-04

Lab Sample ID: 500-217043-4
Matrix: Water
Date Collected: 05/23/22 13:57
Date Received: 05/24/22 09:15

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	PrecSep-21			567407	05/26/22 10:39	MS	TAL SL
Total/NA	Analysis	903.0		1	570475	06/17/22 08:38	CLP	TAL SL
Total/NA	Prep	PrecSep_0			567410	05/26/22 10:58	MS	TAL SL
Total/NA	Analysis	904.0		1	570137	06/15/22 11:37	FLC	TAL SL

Client Sample ID: Duplicate

Lab Sample ID: 500-217043-5
Matrix: Water
Date Collected: 05/23/22 00:00
Date Received: 05/24/22 09:15

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	PrecSep-21			567407	05/26/22 10:39	MS	TAL SL
Total/NA	Analysis	903.0		1	570475	06/17/22 08:38	CLP	TAL SL
Total/NA	Prep	PrecSep_0			567410	05/26/22 10:58	MS	TAL SL
Total/NA	Analysis	904.0		1	570137	06/15/22 11:37	FLC	TAL SL

Lab Chronicle

Client: KPRG and Associates, Inc.
Project/Site: Waukegan Station Permit (RAD)

Job ID: 500-217043-2

Client Sample ID: MW-05

Lab Sample ID: 500-217043-6

Date Collected: 05/24/22 12:11
Matrix: Water
Date Received: 05/25/22 09:40

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	PrecSep-21			567635	05/27/22 12:50	MS	TAL SL
Total/NA	Analysis	903.0		1	570923	06/21/22 08:52	FLC	TAL SL
Total/NA	Prep	PrecSep_0			567644	05/27/22 14:36	MS	TAL SL
Total/NA	Analysis	904.0		1	570152	06/15/22 14:00	FLC	TAL SL

Client Sample ID: MW-06

Lab Sample ID: 500-217043-7

Date Collected: 05/24/22 13:40
Matrix: Water
Date Received: 05/25/22 09:40

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	PrecSep-21			567635	05/27/22 12:50	MS	TAL SL
Total/NA	Analysis	903.0		1	570923	06/21/22 08:53	FLC	TAL SL
Total/NA	Prep	PrecSep_0			567644	05/27/22 14:36	MS	TAL SL
Total/NA	Analysis	904.0		1	570152	06/15/22 14:00	FLC	TAL SL

Client Sample ID: MW-07

Lab Sample ID: 500-217043-8

Date Collected: 05/24/22 13:01
Matrix: Water
Date Received: 05/25/22 09:40

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	PrecSep-21			567635	05/27/22 12:50	MS	TAL SL
Total/NA	Analysis	903.0		1	570923	06/21/22 08:53	FLC	TAL SL
Total/NA	Prep	PrecSep_0			567644	05/27/22 14:36	MS	TAL SL
Total/NA	Analysis	904.0		1	570152	06/15/22 14:01	FLC	TAL SL

Laboratory References:

TAL SL = Eurofins St. Louis, 13715 Rider Trail North, Earth City, MO 63045, TEL (314)298-8566

Accreditation/Certification Summary

Client: KPRG and Associates, Inc.
Project/Site: Waukegan Station Permit (RAD)

Job ID: 500-217043-2

Laboratory: Eurofins St. Louis

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
Alaska (UST)	State	20-001	05-06-25
ANAB	Dept. of Defense ELAP	L2305	04-06-25
ANAB	Dept. of Energy	L2305.01	04-06-25
ANAB	ISO/IEC 17025	L2305	04-06-25
Arizona	State	AZ0813	12-08-22
California	Los Angeles County Sanitation Districts	10259	06-30-22
California	State	2886	07-01-22
Connecticut	State	PH-0241	03-31-23
Florida	NELAP	E87689	06-30-22
HI - RadChem Recognition	State	n/a	06-30-22
Illinois	NELAP	200023	11-30-22
Iowa	State	373	12-01-22
Kansas	NELAP	E-10236	10-31-22
Kentucky (DW)	State	KY90125	12-31-22
Kentucky (WW)	State	KY90125 (Permit KY0004049)	12-31-22
Louisiana	NELAP	04080	06-30-22
Louisiana (DW)	State	LA011	12-31-22
Maryland	State	310	09-30-22
MI - RadChem Recognition	State	9005	06-30-22
Missouri	State	780	06-30-22
Nevada	State	MO000542020-1	07-31-22
New Jersey	NELAP	MO002	06-30-22
New York	NELAP	11616	04-01-23
North Dakota	State	R-207	06-30-22
NRC	NRC	24-24817-01	12-31-22
Oklahoma	NELAP	9997	08-31-22
Oregon	NELAP	4157	09-01-22
Pennsylvania	NELAP	68-00540	02-28-23
South Carolina	State	85002001	06-30-22
Texas	NELAP	T104704193	07-31-22
US Fish & Wildlife	US Federal Programs	058448	07-31-22
USDA	US Federal Programs	P330-17-00028	03-11-23
Utah	NELAP	MO000542021-14	08-01-22
Virginia	NELAP	10310	06-14-23
Washington	State	C592	08-30-22
West Virginia DEP	State	381	10-31-22

Tracer/Carrier Summary

Client: KPRG and Associates, Inc.
Project/Site: Waukegan Station Permit (RAD)

Job ID: 500-217043-2

Method: 903.0 - Radium-226 (GFPC)

Matrix: Water **Prep Type: Total/NA**

		Percent Yield (Acceptance Limits)
		Ba
Lab Sample ID	Client Sample ID	(40-110)
500-217043-1	MW-01	92.8
500-217043-2	MW-02	91.8
500-217043-3	MW-03	92.3
500-217043-4	MW-04	95.0
500-217043-5	Duplicate	97.3
500-217043-6	MW-05	72.3
500-217043-7	MW-06	95.0
500-217043-8	MW-07	83.8
500-217043-8 DU	MW-07	77.0
LCS 160-567407/1-A	Lab Control Sample	98.8
LCS 160-567635/1-A	Lab Control Sample	95.5
MB 160-567407/16-A	Method Blank	99.8
MB 160-567635/22-A	Method Blank	84.8

Tracer/Carrier Legend

Ba = Ba Carrier

Method: 904.0 - Radium-228 (GFPC)

Matrix: Water **Prep Type: Total/NA**

		Percent Yield (Acceptance Limits)	
		Ba	Y
Lab Sample ID	Client Sample ID	(40-110)	(40-110)
500-217043-1	MW-01	92.8	89.3
500-217043-2	MW-02	91.8	89.7
500-217043-3	MW-03	92.3	85.6
500-217043-4	MW-04	95.0	86.0
500-217043-5	Duplicate	97.3	88.2
500-217043-6	MW-05	72.3	81.9
500-217043-7	MW-06	95.0	81.1
500-217043-8	MW-07	83.8	84.9
500-217043-8 DU	MW-07	77.0	84.9
LCS 160-567410/1-A	Lab Control Sample	98.8	92.7
LCS 160-567644/1-A	Lab Control Sample	95.5	86.4
MB 160-567410/16-A	Method Blank	99.8	90.8
MB 160-567644/22-A	Method Blank	84.8	87.5

Tracer/Carrier Legend

Ba = Ba Carrier
Y = Y Carrier

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Exhibit

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N P D E S
MICROFILM "JACKET" INFORMATION

1. Division Code: W
2. FIPS County Code: 097
3. City/Township Code: 190
4. Governing Body Code: 0500A
5. PERMITTEE NAME (File Subject)
   COMMONWEALTH EDISON-WAUKEGAN 11174
6. File Division: 13
7. NPDES Number: IL0002259

CROSS-REFERENCE INFORMATION

8. Governing Body Name
   COMMONWEALTH EDISON COMPANY
9. F/S/P Code: ---------
10. Date Identified In The [illegible]d Refers To:
    a. Permit Issue Date: 11-27-74
    b. Permit Cancellation Date: --=--=--
    c. No Permit Required Date: --=--=--
11. Permit Expiration Date: 10-01-79

DWPC Records Unit
ADM 1079

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RECEIVED
DEC 2 1974
DIV. OF WATER POLLUTION CONTROL
ENVIRONMENTAL PROTECTION AGENCY

27 NOV 1974

CERTIFIED MAIL
RETURN RECEIPT REQUESTED

Mr. Byron Lee, Jr.
Vice President
Commonwealth Edison Company
Post Office Box 767
Chicago, Illinois 60690

Re: NPDES Permit No. IL 0002259

Dear Mr. Lee:

Your application IL 070 0X3 2 720352 for a National Pollutant Discharge Elimination System (NPDES) Permit has been processed in accordance with Sections 402 and 405 of the Federal Water Pollution Control Act Amendments of 1972 (86 Stat. 816; Public Law 92-500, 33 U.S.C. 1251 et seq.).

The enclosed NPDES Permit covers your operations which discharge into Lake Michigan at Waukegan, Illinois. All discharges from this facility shall be consistent with the terms and conditions of this permit. Please note that the amendments to 40 CFR 125 (published July 24, 1974 in the Federal Register at 27078-27084) require that any request for an adjudicatory hearing must be made within 10 days of receipt of this permit.

Very truly yours,

ORIGINAL SIGNED BY JAMES O. McDONALD

James O. McDonald, Director
Enforcement Division

Enclosures
Permit
Reporting Forms

cc: Mr. W. H. Busch, Illinois Environmental Protection Agency w/Permit

Electronic Filing: Received, Clerk's Office 10/31/2022

Permit No. IL 0002259

Application No. IL 070 0X3 2 720352

AUTHORIZATION TO DISCHARGE UNDER THE

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM

In compliance with the provisions of the Federal Water Pollution Control Act, as amended, (33 U.S.C. 1251 et seq; the "Act"),

COMMONWEALTH EDISON COMPANY, WAUKEGAN STATION

is authorized by the United States Environmental Protection Agency, Region V, to discharge from a facility located at Waukegan, Illinois

to receiving waters named Lake Michigan

in accordance with effluent limitations, monitoring requirements and other conditions set forth in Parts I, II, and III hereof.

This permit and the authorization to discharge shall expire at midnight, October 1, 1979 . Permittee shall not discharge after the above date of expiration. In order to receive authorization to discharge beyond the date of expiration, the permittee shall submit such information, forms, and fees as are required by the Agency authorized to issue NPDES permits no later than 180 days prior to the above date of expiration.

This permit shall become effective 30 days from this date of signature.

Signed this 27 NOV 1974

James O. Thompson

Director, Enforcement Division

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Permit No. IL 0002259

PART I

A. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

1. During the period beginning on the effective date of this permit and lasting until February 28, 1976 the permittee is authorized to discharge from outfall(s) serial number(s) 001

Such discharges shall be limited and monitored by the permittee as specified below:

EFFLUENT CHARACTERISTIC	DISCHARGE LIMITATIONS kg/day (lbs/day) Daily Avg	kg/day (lbs/day) Daily Max	Other Units (Specify) Daily Avg	Other Units (Specify) Daily Max	MONITORING REQUIREMENTS Measurement Frequency	Sample Type
Flow-m^3/day (MGD)	-	-	-	-	Continuous	-
Temperature °C(°F)*	-	-	-	-	Continuous	-
Total Chlorine Residual**	-	-	-		Weekly	Grab
Waste Heat Rejection Rate KJ/hr.(BTU/hr.)		-	-		Monthly	Maximum
Plant Capacity Factor (% Capacity)	-	-	-		Monthly	Average
Duration of Chlorination	-	-	-	-	Monthly	Report
Frequency of Chlorination	-	-	-	-	Monthly	Report

There shall be no discharge of floating solids or visible foam in other than trace amounts.

Samples taken in compliance with the monitoring requirements specified above shall be taken at the following location(s): At a point representative of the discharge but prior to entry into Lake Michigan.

* Intake and Discharge

** During the chlorination period not to exceed 2 hours per day per plant.

See page 20 of 20

Permit No. IL 0002259

PART I

A. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

1. During the period beginning March 1, 1976 and lasting until Jul. 30, 1977 the permittee is authorized to discharge from outfall(s) serial number(s) 001

Such discharges shall be limited and monitored by the permittee as specified below:

EFFLUENT CHARACTERISTIC	DISCHARGE LIMITATIONS kg/day (lbs/day)		Other Units (Specify)		MONITORING REQUIREMENTS Measurement Frequency	Sample Type
	Daily Avg	Daily Max	Daily Avg.	Daily Max		
Flow - m^3/day (MGD)	-	-	-	-	Continuous	-
Temperature °C(°F)*	-	-	-	-	Continuous	-
Total Chlorine Residual**	-	-	-	0.04 mg/l	Daily	Grab
Waste Heat Rejection Rate KJ/hr.(BTU/hr.)	-	-	-	-	Monthly	Maximum
Plant Capacity Factor (% Capacity)	-	-	-	-	Monthly	Average
Duration of Chlorination	-	-	-	-	Monthly	Report
Frequency of Chlorination	-	-	-	-	Monthly	Report

There shall be no discharge of floating solids or visible foam in other than trace amounts.

Samples taken in compliance with the monitoring requirements specified above shall be taken at the following location(s): At a point representative of the discharge but prior to entry into Lake Michigan.

*Intake and Discharge

**During chlorination periods not to exceed 2 hours per day per plant. If the plume temperature exceeds 70°F the limit shall be 0.2 mg/l. See page 20 of 20

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Permit No. IL 0002259

PART I

A. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

3. During the period beginning July 1, 1977 and lasting until October 1, 1979 the permittee is authorized to discharge from outfall(s) serial number(s) 001

Such discharges shall be limited and monitored by the permittee as specified below:

EFFLUENT CHARACTERISTIC	DISCHARGE LIMITATIONS kg/day (lbs/day)		DISCHARGE LIMITATIONS Other Units (Specify)		MONITORING REQUIREMENTS Measurement Frequency	MONITORING REQUIREMENTS Sample Type
	Daily Avg	Daily Max	Daily Avg	Daily Max		
Flow-M^3/Day (MGD)	-	-	-	-	Continuous	-
Temperature °C(°F)*	-	-	-	-	Continuous	-
Total Chlorine Residual **	-	-	-	0.04 mg/l	Daily	Grab
Waste Heat Rejection Rate KJ/hr.(BTU/hr.)		-	-	-	Monthly	Maximum
Plant Capacity Factor (% Capacity)	-	-	-	-	Monthly	Average
Duration of Chlorination Period	-	-	-	-	Monthly	Report
Frequency of Chlorination	-	-	-	-	Monthly	Report

There shall be no discharge of floating solids or visible foam in other than trace amounts.

Samples taken in compliance with the monitoring requirements specified above shall be taken at the following location(s): At a point representative of the discharge but prior to entry into Lake Michigan.

*Intake and Discharge

**During chlorination periods not to exceed 2 hours per day per plant. If the plume temperature exceeds 70°F the limit shall be 0.2 mg/l. See page 20 of 20

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Permit No. IL 0002259

A. EFFLUENT LIMITATIONS AND REQUIREMENTS

4. During the period beginning July 1, 1977 and lasting until October 1, 1979 the permittee is authorized to discharge from outfalls serial number 001.*

Such discharges shall be limited and monitored by the permittee as specified below:

a. i. The heated effluent shall at no time raise the natural temperature of Lake Michigan more than 3°F at the edge of the mixing zone.

ii. The water temperature at the edge of the mixing zone, and at other representative locations in the Lake shall not exceed the maximum limits (°F) indicated in the following table:

JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC
45	45	45	55	60	70	80	80	80	65	60	50

iii. The mixing zone shall be no greater than the area of a circle with a radius of 1000 ft.

* These limitations are not applicable if the permittee's 316(a) demonstration is acceptable.

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A. EFFLUENT LIMITATIONS AND REQUIREMENTS (Cont'd)

4b. i. The permittee shall determine the area and shape of the mixing zone once per quarter.

All mixing zone measurements shall be reported once per quarter to the Regional Administrator and the Illinois Environmental Protection Agency.

ii. No later than sixty (60) days after the time the additional information for 316(a) is submitted but no later than December 1, 1975, the permittee shall submit to the Regional Administrator for approval, a study plan for the investigation of the effects of the heated effluent on the ecology of the receiving waters. The study plan must address those materials developed by the Lake Michigan Cooling Water Studies Panel in its review of the Lake Michigan Studies. In addition, the study plan must be designed to assess, in cooperation with other utilities, the lake-wide effects of cooling water use with emphasis on the southern end of Lake Michigan* Within six (6) months of the approval of these designs, the permittee shall have initiated the investigation and beginning after one (1) year of approval, the permittee shall submit annual status reports. In addition, as a part of the application for renewal of this permit, a summary status report of this study shall be submitted.

All data and records associated with this study shall be retained in their entirety by the permittee and shall be made available subject to the request of the Regional Administrator and/or the Illinois Environmental Protection Agency.

*This study requirement can be satisfied by the completion of the similar requirement for the Zion station.

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Permit No. IL 0002259

PART I

A. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

5. During the period beginning on the effective date of this permit and lasting until October 1, 1979 the permittee is authorized to discharge from outfall(s) serial number(s) 002-ash pond overflow

Such discharges shall be limited and monitored by the permittee as specified below:

EFFLUENT CHARACTERISTIC	DISCHARGE LIMITATIONS kg/day (lbs/day) Daily Avg	kg/day (lbs/day) Daily Max	Other Units (Specify) Daily Avg	Other Units (Specify) Daily Max	MONITORING REQUIREMENTS Measurement Frequency	Sample Type
Flow, M³/Day (MGD)	-	-	-	-	Measure when sampling	
Dissolved Solids	-	-	-	Δ 750 mg/l	Weekly	24-hr.Composite
Suspended Solids	-	-	-	15 mg/l	Weekly	24-hr.Composite
Oil & Grease	-	-	-	15 mg/l	Weekly	Grab
Iron (Total)	-	-	-	2.0 mg/l	Monthly	24-hr.Composite
Iron (Dissolved)	-	-	-	0.5 mg/l	Monthly	24-hr.Composite
Nickel (Total)	-	-	-	1.0 mg/l	Monthly	24-hr.Composite

The pH shall not be less than 6.0 nor greater than 9.0 and shall be monitored by weekly grab samples.

There shall be no discharge of floating solids or visible foam in other than trace amounts.

Samples taken in compliance with the monitoring requirements specified above shall be taken at the following location(s): At a point representative of the discharge but prior to entry into the unnamed ditch, tributary to Lake Michigan.

Permit No. IL 0002259

PART I

A. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

6. During the period beginning on the effective date of this permit and lasting until December 31, 1977 the permittee is authorized to discharge from outfall(s) serial number(s) 002-Demineralizer Regenerant Wastes

Such discharges shall be limited and monitored by the permittee as specified below:

EFFLUENT CHARACTERISTIC	DISCHARGE LIMITATIONS kg/day (lbs/day) Daily Avg	kg/day (lbs/day) Daily Max	Other Units (Specify) Daily Avg	Other Units (Specify) Daily Max	MONITORING REQUIREMENTS Measurement Frequency	Sample Type
Flow, M³/Day (MGD)	-	-	-	-	Measure when sampling	
Total Dissolved Solids	-	-	-	8540 mg/l	Weekly when discharging	24-hour Composite

Samples taken in compliance with the monitoring requirements specified above shall be taken at the following location(s): At a point representative of the discharge but prior to mixing with other waters.

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PART I

A. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

7. During the period beginning January 1, 1978 and lasting until October 1, 1979 the permittee is authorized to discharge from outfall(s) serial number(s) 002-Demineralizer Regenerant Wastes

Such discharges shall be limited and monitored by the permittee as specified below:

EFFLUENT CHARACTERISTIC	DISCHARGE LIMITATIONS kg/day (lbs/day) Daily Avg	kg/day (lbs/day) Daily Max	Other Units (Specify) Daily Avg	Other Units (Specify) Daily Max	MONITORING REQUIREMENTS Measurement Frequency	Sample Type
Flow MGD/Day (MGD)	-	-	-	-	Measure when sampling	
Total Dissolved Solids	-	-	-	3500 mg/l*	Weekly when discharging	24-hour Composite

*Limitation is contingent upon the results of a feasibility study for dissolved solids control. Progress of this study shall be reported in accordance with Part I.C.

Samples taken in compliance with the monitoring requirements specified above shall be taken at the following location(s): At a point representative of the discharge but prior to mixing with other waters.

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B. MONITORING AND REPORTING

1. Representative Sampling

Samples and measurements taken as required herein shall be representative of the volume and nature of the monitored discharge.

2. Reporting

Monitoring results obtained during the previous three months shall be summarized and reported on a Discharge Monitoring Report Form (EPA No. 3320-1), postmarked no later than the 28th day of the month following the completed reporting period. The first report is due on January 28, 1975. Duplicate signed copies of these, and all other reports required herein, shall be submitted to the Regional Administrator and the State at the following addresses:

U. S. Environmental Protection Agency
Region V, Enforcement Division
Attn: Chief Compliance Section
230 South Dearborn Street
Chicago, Illinois 60604

Illinois Environmental Protection Agency
2200 Churchill Road
Springfield, Illinois 62706

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3. Definitions

a. "Daily Average" Discharge

1. Weight Basis - The "daily average" discharge means the total discharge by weight during a calendar month divided by the number of days in the month that the production or commercial facility was operating. Where less than daily sampling is required by this permit, the daily average discharge shall be determined by the summation of the measured daily discharges by weight divided by the number of days during the calendar month when the measurements were made.

2. Concentration Basis - The "daily average" concentration means the arithmetic average (weighted by flow value) of all the daily determinations of concentration made during a calendar month. Daily determinations of concentration made using a composite sample shall be the concentration of the composite sample. When grab samples are used, the daily determination of concentration shall be the arithmetic average (weighted by flow value) of all the samples collected during the calendar day.

b. "Daily Maximum" Discharge

1. Weight Basis - the "daily maximum" discharge means the total discharge by weight during any calendar day.

2. Concentration Basis - the "daily maximum" concentration means the daily determination of concentration for any calendar day.

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4. Test Procedures

Test procedures for the analysis of pollutants shall conform to regulations published pursuant to Section 304(g) of the Act, under which such procedures may be required.

5. Recording of Results

For each measurement or sample taken pursuant to the requirements of this permit, the permittee shall record the following information:

a. The exact place, date, and time of sampling;

b. The dates the analyses were performed;

c. The person(s) who performed the analyses;

d. The analytical techniques or methods used; and

e. The results of all required analyses.

6. Additional Monitoring by Permittee

If the permittee monitors any pollutant at the location(s) designated herein more frequently than required by this permit, using approved analytical methods as specified above, the results of such monitoring shall be included in the calculation and reporting of the values required in the Discharge Monitoring Report From (EPA No. 3320-1). Such increased frequency shall also be indicated.

7. Records Retention

All records and information resulting from the monitoring activities required by this permit including all records of analyses performed and calibration and maintenance of instrumentation and recordings from continuous monitoring instrumentation shall be retained for a minimum of three (3) years, or longer if requested by the Regional Administrator or the State water pollution control agency.

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C. SCHEDULE OF COMPLIANCE

1. The permittee shall achieve compliance with the effluent limitations specified for discharges in accordance with the following schedule:

Chlorine Reduction

Commencement of Chlorination Study and Removal of Chlorination Pipe from Intake Tunnel	-	October 1, 1975
Completion of Chlorination Study and Submission of Interim Chlorine Limits	-	February 28, 1976
Effective date of Interim Limits	-	March 1, 1976
Commencement of Bioassay Study, if necessary	-	March 31, 1976
Progress Report	-	November 1, 1976
Attainment of Final Limit	-	July 1, 1977

Dissolved Solids Reduction

Preliminary Report	-	July 1, 1975
Preparation of Plans & Specifications	-	December 1, 1975
Start of Construction	-	April 1, 1976
Report of Progress	-	January 1, 1977
Report of Progress	-	July 1, 1977
Start of Full Operation	-	January 1, 1978

Thermal Reduction

Completion of Preliminary Plans	-	December 31, 1974
Deadline for successful 316(a) demonstration	-	October 1, 1975
Completion of Final Plans	-	December 31, 1975
Commencement of Construction	-	March 31, 1976
Report of Construction Progress	-	September 30, 1976
Completion of Construction	-	March 31, 1977
Attainment of Operational Level	-	July 1, 1977

2. No later than 14 calendar days following a date identified in the above schedule of compliance, the permittee shall submit either a report of progress or, in the case of specific actions being required by identified dates, a written notice of compliance or noncompliance. In the latter case, the notice shall include the cause of noncompliance, any remedial actions taken, and the probability of meeting the next scheduled requirements.

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PART II

A. MANAGEMENT REQUIREMENTS

1. Change in Discharge

All discharges authorized herein shall be consistent with the terms and conditions of this permit. The discharge of any pollutant identified in this permit more frequently than or at a level in excess of that authorized shall constitute a violation of the permit. Any anticipated facility expansions, production increases, or process modifications which will result in new, different, or increased discharges of pollutants must be reported by submission of a new NPDES application or, if such changes will not violate the effluent limitations specified in this permit, by notice to the permit issuing authority of such changes. Following such notice, the permit may be modified to specify and limit any pollutants not previously limited.

2. Noncompliance Notification

If, for any reason, the permittee does not comply with or will be unable to comply with any daily maximum effluent limitation specified in this permit, the permittee shall provide the Regional Administrator and the State with the following information, in writing, within five (5) days of becoming aware of such condition:

a. A description of the discharge and cause of noncompliance; and

b. The period of noncompliance, including exact dates and times; or, if not corrected, the anticipated time the noncompliance is expected to continue, and steps being taken to reduce, eliminate and prevent recurrence of the noncomplying discharge.

3. Facilities Operation

The permittee shall at all times maintain in good working order and operate as efficiently as possible all treatment or control facilities or systems installed or used by the permittee to achieve compliance with the terms and conditions of this permit.

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4. Adverse Impact

The permittee shall take all reasonable steps to minimize any adverse impact to navigable waters resulting from noncompliance with any effluent limitations specified in this permit, including such accelerated or additional monitoring as necessary to determine the nature and impact of the noncomplying discharge.

5. Bypassing

Any diversion from or bypass of facilities necessary to maintain compliance with the terms and conditions of this permit is prohibited, except (i) where unavoidable to prevent loss of life or severe property damage, or (ii) where excessive storm drainage or runoff would damage any facilities necessary for compliance with the effluent limitations and prohibitions of this permit. The permittee shall promptly notify the Regional Administrator and the State in writing of each such diversion or bypass.

6. Removed Substances

Solids, sludges, filter backwash, or other pollutants removed from or resulting from treatment or control of wastewaters shall be disposed of in a manner such as to prevent any pollutant from such materials from entering navigable waters.

7. Power Failures

In order to maintain compliance with the effluent limitations and prohibitions of this permit, the permittee shall either:

a. In accordance with the Schedule of Compliance contained in Part I, provide an alternative power source sufficient to operate the wastewater control facilities;

or, if no date for implementation appears in Part I,

b. Halt, reduce or otherwise control production and/or all discharges upon the reduction, loss, or failure of one or more of the primary sources of power to the wastewater control facilities.

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B. RESPONSIBILITIES

1. Right of Entry

The permittee shall allow the head of the State water pollution control agency, the Regional Administrator, and/or their authorized representatives, upon the presentation of credentials:

a. To enter upon the permittee's premises where an effluent source is located or in which any records are required to be kept under the terms and conditions of this permit; and

b. At reasonable times to have access to and copy any records required to be kept under the terms and conditions of this permit; to inspect any monitoring equipment or monitoring method required in this permit; and to sample any discharge of pollutants.

2. Transfer of Ownership or Control

In the event of any changes in control or ownership of facilities from which the authorized discharges emanate, the permittee shall notify the succeeding owner or controller of the existence of this permit by letter, a copy of which shall be forwarded to the Regional Administrator and the State water pollution control agency.

3. Availability of Reports

Except for data determined to be confidential under Section 308 of the Act, all reports prepared in accordance with the terms of this permit shall be available for public inspection at the offices of the State water pollution control agency and the Regional Administrator. As required by the Act, effluent data shall not be considered confidential. Knowingly making any false statement on any such report may result in the imposition of criminal penalties as provided for in Section 309 of the Act.

4. Permit Modification

After notice and opportunity for a hearing, this permit may be modified, suspended, or revoked in whole or in part during its term for cause including, but not limited to, the following:

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a. Violation of any terms or conditions of this permit;

b. Obtaining this permit by misrepresentation or failure to disclose fully all relevant facts; or

c. A change in any condition that requires either a temporary or permanent reduction or elimination of the authorized discharge.

5. Toxic Pollutants

Notwithstanding Part II, B-4 above, if a toxic effluent standard or prohibition (including any schedule of compliance specified in such effluent standard or prohibition) is established under Section 307(a) of the Act for a toxic pollutant which is present in the discharge and such standard or prohibition is more stringent than any limitation for such pollutant in this permit, this permit shall be revised or modified in accordance with the toxic effluent standard or prohibition and the permittee so notified.

6. Civil and Criminal Liability

Except as provided in permit conditions on "Bypassing" (Part II, A-5) and "Power Failures" (Part II, A-7), nothing in this permit shall be construed to relieve the permittee from civil or criminal penalties for noncompliance.

7. Oil and Hazardous Substance Liability

Nothing in this permit shall be construed to preclude the institution of any legal action or relieve the permittee from any responsibilities, liabilities, or penalties to which the permittee is or may be subject under Section 311 of the Act.

8. State Laws

Nothing in this permit shall be construed to preclude the institution of any legal action or relieve the permittee from any responsibilities, liabilities, or penalties established pursuant to any applicable State law or regulation under authority preserved by Section 510 of the Act.

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9. Property Rights

The issuance of this permit does not convey any property rights in either real or personal property, or any exclusive privileges, nor does it authorize any injury to private property or any invasion of personal rights, nor any infringement of Federal, State or local laws or regulations.

10. Severability

The provisions of this permit are severable, and if any provision of this permit, or the application of any provision of this permit to any circumstance, is held invalid, the application of such provision to other circumstances, and the remainder of this permit, shall not be affected thereby.

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PART III

OTHER REQUIREMENTS

1. Intake Structures

Within 30 days of the receipt of the permit and the determination of the Regional Administrator, the permittee shall submit to the Regional Administrator and the Illinois Environmental Protection Agency for approval the design for an intake monitoring program to document the effects of the present intake on the various species and life stages of fish. Such a monitoring program shall include, but not be limited to, a tabulation of all fish trapped by the present intake structure. This tabulation shall be performed every fourth day unless the permittee justifies some alternative schedule to the Regional Administrator and the Illinois Environmental Protection Agency within thirty (30) days after the receipt of the permit and determination of the Regional Administrator. The tabulation shall begin immediately upon completion of the Waukegan Station's new chlorination system but no later than October 1, 1975 and end within twelve (12) months of the commencement of tabulation and shall include the number, weight, length, and species of each fish entrapped. Such monitoring data shall be submitted quarterly with other reports.

The permittee shall submit a final report to the Regional Administrator and to the Illinois Environmental Protection Agency by no later than December 1, 1976 providing proposals for measures to be taken by the permittee to meet the requirements of Section 316(b) of the Act for the best cooling water intake technology available. Development of the report shall be guided by the "Development Document for Best Technology Available for Minimizing Adverse Environmental Impact for Cooling Water Intake Structures", as proposed by the U. S. EPA and by "Lake Michigan Intake Report on Best Available Technology by Lake Michigan Cooling Water Intake Technical Committee, August 1973".

This report shall be evaluated with regard to Section 316(b) of the Act. As a result of this evaluation, the Regional Administrator may modify the permit in accordance with Part IIB4 to establish an implementation schedule to insure compliance with Section 316(b).

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Permit No. IL 0002259

PART III

OTHER REQUIREMENTS(Cont'd)

2. Additional Reporting of Monitoring to Illinois Environmental Protection Agency

Monitoring results obtained during the previous three months shall be summarized and reported on a Discharge Monitoring Report Form (EPA No. 3320-1), postmarked no later than the 28th day of the month following the completed reporting period. The first quarterly report is due on January 28, 1975. The signed reports required herein, shall be submitted to the State at the following address:

Environmental Protection Agency
State of Illinois
Division of Water Pollution Control
2200 Churchill Road
Springfield, Illinois 62706

3. Chlorination

A. The permittee will, on or before October 1, 1975, commence a study of the chlorination system at the Waukegan Generating Station (the Study), and, will on or before February 28, 1976, submit to U.S. EPA a report of the results of the Study and shall make such data available to U.S. EPA during the interim as requested.

B. If the results of the Study called for in A, above show that the total chlorine residual in a concentration greater than .04 mg/l* is necessary in order to prevent fouling of Station's condensers, that concentration shall be the limitation applicable, in lieu of .04 mg/l*, from March 1, 1976, until June 30, 1977, and the company will, on or before March 31, 1976, commence, with the advice, consultation and approval of U.S. EPA, a bio-assay to study the impact upon representative species of fish of exposure to that concentration of total chlorine residual for the period of time that exposures would occur.

C. If the results of the bio-assay called for in B, above, show that representative species of fish do not sustain damage from the concentrations of total chlorine residual greater than .04 mg/l*for the period of time that exposure would occur, that concentration, or, if lower, the concentration found by the company from the results of the Study to have to be discharged to Lake Michigan from Waukegan Generating Station in order to prevent fouling of the Station's condensers, shall be the limitation applicable in lieu of .04 mg/l*, from July 1, 1977 until termination of the permit.

*If the plume temperature exceeds 70°F the limit shall be 0.2 mg/l.

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Exhibit

36

W0971900500A COMMONWEALTH EDISON-WAUKEGAN /1174 16[S] IL0002259 1

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N P D E S
MICROFILM "JACKET" INFORMATION

1. Division Code: W
2. FIPS County Code: 097
3. City/Township Code: 190
4. Governing Body Code: 0500A
5. PERMITTEE NAME (File Subject)
   COMMONWEALTH EDISON-WAUKEGAN 1174
6. File Division: 16
7. NPDES Number: IL0002259

CROSS-REFERENCE INFORMATION

8. Governing Body Name
   COMMONWEALTH EDISON COMPANY
9. F/S/P Code: ---------
10. Date Identified In The Name Field Refers To:
    a. Permit Issue Date: 11-27-74
    b. Permit Cancellation Date: --=--=--
    c. No Permit Required Date: --=--=--
11. Permit Expiration Date: 10-01-79

DWPC Records Unit
ADM 1079

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Rec'd 9-19-72

FORM APPROVED OMB NO. 49-R 01

DEPARTMENT OF THE ARMY, CORPS OF ENGINEERS

APPLICATION FOR PERMIT TO DISCHARGE OR WORK IN NAVIGABLE WATERS AND THEIR TRIBUTARIES

IL 000 2259

SECTION I. GENERAL INFORMATION

1. State	Application Number (to be assigned by Corps of Engineers)			
	Div.	Dist.	Type	Sequence No.
I L	0 7 0	2 6 5	4	7 2 2 6 2 3

2. Name of applicant and title of signing official: Commonwealth Edison Company
Vice President

3. Mailing address of applicant:
Commonwealth Edison Company — WAUKEGAN
Box 767
Chicago, Illinois 60690

4. Name, address, telephone number and title of applicant's authorized agent for permit application coordination and correspondence:
Dr. V. Stevens Hastings
Director of Environmental Planning
Commonwealth Edison Company
Box 767
Chicago, Illinois 60690
Tel/312-294-2921

NOTE TO APPLICANT: Refer to the pamphlet entitled "Permits for Work and Structures in and for Discharges or Deposits into Navigable Waters" before attempting to complete this form.

Required Information

a. All information contained in this application will, upon request, be made available to the public for inspection and copying. A separate sheet entitled "Confidential Answers" must be used to set out information which is considered by the applicant to constitute trade secrets or commercial or financial information of a confidential nature. The information must clearly indicate the item number to which it applies. Confidential treatment can be considered only for that information for which a specific written request of confidentiality has been made on the attached sheet. However, in no event will identification of the contents and frequency of a discharge be recognized as confidential or privileged information.

b. The applicant shall furnish such supplementary information as is required by the District Engineer in order to evaluate the application.

c. If additional space is needed for a complete response to any item on this form, attach a sheet entitled "Additional Information," indicate on that sheet the item numbers to which answers apply.

d. Drawings required by items 20 and 21 should be attached to this application. Other papers which must be attached to this application include, if applicable, copies of a water quality certification or a written communication which describes water quality impact (see Item 22 and Item 10 of Section II below), the additional information sheet(s) in "c" above, and the confidential information sheet described in "a" above.

Fees

If any discharge or deposit is involved, an application fee of $100 must be submitted with this application. An additional $50 is required for each additional point of discharge or deposit.

Signature

a. If a discharge is involved, an application submitted by a corporation must be signed by the principal executive officer of that corporation or by an official of the rank of corporate vice president or above who reports directly to such principal executive officer and who has been designated by the principal executive officer to make such applications on behalf of the corporation. In the case of a partnership or a sole proprietorship, the application must be signed by a general partner or the proprietor. Other signature requirements are discussed in the pamphlet.

b. If no discharge is involved, an application may be signed by the applicant or his authorized agent.

Application is hereby made for a permit or permits to authorize the activities described herein. I certify that I am familiar with the information contained in this application, and that to the best of my knowledge and belief such information is true, complete, and accurate.

K. V. Hastings
Signature of Applicant

18 U.S.C. Section 1001 provides that:

Whoever, in any matter within the jurisdiction of any department or agency of the United States knowingly and willfully falsifies, conceals or covers up by any trick, scheme, or device a material fact, or makes any false, fictitious or fraudulent statements or representations, or makes or uses any false writing or document knowing same to contain any false, fictitious or fraudulent statement or entry, shall be fined not more than $10,000 or imprisoned not more than five years, or both.

FOR CORPS OF ENGINEERS USE ONLY

Acronym name of applicant

Are discharge structures: Major? [X] Minor? [ ] N/A? [ ]

Date received, form not complete — — — — — —
Date received, form complete but without certificate — — — — —
Date received, form complete — — — — — —
Date of Cert./Ltr. — — — — — —
(day / mo / yr)

Date sent to EPA, form not complete — — — — — —
Date sent to EPA, NOAA, D/I, AEC, FPC in complete form — — — — — —
(day / mo / yr)

ENG FORM 4345 MAY 71

5. Date: 11 17 (mo day yr)

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(Office use only)

6. Check type of application: a. Original [X] b. Revision [ ]

7. Number of original application: IL 272 0352

8. Name of facility where discharge or construction will occur.

Waukegan Generating Station

9. Full mailing address of facility named in item 8 above.

Commonwealth Edison Company
Waukegan Station
Greenwood and Lake Michigan
Waukegan, Illinois 60085

10. Names and mailing addresses of all adjoining property owners whose property also adjoins the waterway.

North: City of Waukegan, Waukegan, Illinois 60085
South: North Shore Sanitary District, Dahringer Road, Waukegan, Illinois

11. Check to indicate the nature of the proposed activity:

a. Dredging [ ] b. Construction [ ] c. Construction with Discharge [ ] d. Discharge only [X]

12. If activity is temporary in nature, estimate its duration in months.

If application is for a discharge:

13. List intake sources

Source	Estimated Volume in Million Gallons Per day or Fraction Thereof
Municipal or private water supply system	9 1 4 . 0 2
Surface water body	None
Ground water	None
Other	None

14. Describe water usage within the plant

Type	Estimated Volume in Million Gallons Per day or Fraction Thereof
Cooling water	8 7 8 . 4 0
Boiler Feed water	. 3 7
Process water	3 5 . 2 3
Sanitary system*	. 0 2
Other	None

15. List volume of discharges or losses other than into navigable waters.

Type	Estimated Volume in Million Gallons Per day or Fraction Thereof
Municipal waste treatment system	. 0 2
Surface containment	None
Underground disposal	None
Waste Acceptance firms	None
Evaporation	Negligible
Consumption	None

* Indicate number employees served per day: 300

If structures (ex., or dredging, fillings or other construction will occur, the precise location of the activity must be described.

(Office use only). 27203582

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a. Name the corporate boundaries within which the structures or work of the activity will occur.

16. State: Illinois 17. County: Lake 18. City or Town: Waukegan

b. Name of waterway at the location of the activity

19. Lake Michigan

20. Maps and sketches which show the location and character of each structure or activity, including any and all outfall devices, dispersive devices, and non structural points of discharge, must be attached to this application.

21. For construction or work in navigable waters for which a separate permit is sought under 33 U.S.C. 403, the character of each structure must be fully shown on detailed plans to be submitted with this application. Note on the drawings those structures for which separate discharge information (Section II of this form) has been submitted.

22. List all approvals or denials granted by Federal, interstate, State or local agencies for any structures, construction, discharges or deposits described in this application.

	Type of document	Id. No.	Date	Issuing Agency
Permit:	Const. of Intake & Discharge Flumes		10-10-23	War Dept. (Fed.)
Permit:	Const. of Intake & Discharge Flumes	593	8-21-23	Div. of Waterways (State
Permit:	Extend Breakwater & Intake Flumes	2392	8-8-31	Div. of Waterways (State

(There may be additional permits. Only those for which we have the requested details are listed.)

22. Check if facility existed or was lawfully under construction prior to April 3, 1970. [X]

24. If dredging or filling will occur: Not applicable

State the type of materials involved, their volume in cubic yards, and the proposed method of measurement.

25. Describe the proposed method of instrumentation which will be used to measure the volume of any solids which may be deposited and to determine its effect upon the waterway.

Instrumentation is not believed necessary to determine the amount of solids placed into this waterway. Samples will be taken periodically. It is expected that the dissolved solids will remain in solution. The increments of solids added are not expected to have any significant effect upon the receiving water.

26. State rates and periods of deposition described in Item 25.

See attached

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SECTION II. PLANT PROCESS AND DISCHARGE DESCRIPTION

1. Discharge described below is: a. Present [X] b. Proposed, new or changed [ ] 2. Renewal of NPDES permit [ ] (Office use only) IL 272 0352

Name of corporate boundaries within which the point of discharge is located.

3. State: Illinois 4. County: Lake 5. City or Town: Waukegan, Ill.

6. Discharge Serial No.: 001

State the precise location of the point of discharge.

7. Latitude 42 Degrees; 23 Min; 00 Sec.

8. Longitude 87 Degrees; 48 Min; 30 Sec.

9. Name of waterway at the point of discharge: Lake Michigan

10. Has application for water quality certification or description of impact been made? If so, give date:

Date: 7 mo 1 day 71 yr

Check if certificate is attached to form [ ]

Name Issuing Agency: Illinois Environmental Protection Agency

11. Narrative description of activity (include terms of general 4-digit Standard Industrial Classification, and specific manufacturing process).

Electric Companies and Systems:
The process consists of producing steam in coal and/or gas and oil-fueled boilers to drive generators that produce electricity for distribution to consumers.
The Waukegan plant contains 9 steam boilers and seven generators which have a net capacity of 1047 MW. This plant operated at 55.1% of its capacity in 1970.

12. Standard industrial classification number.	13. Principal product.	14. Amount of principal product produced per day.
SIC #491	Electricity	14,100 MWH

15. Principal raw material.	16. Amount of principal raw material consumed per day.	17. Number of batch discharges per day.
Coal	5,240 Tons	16
Gas	312,000 Therms	
Oil	6910	

18. Average gallons per batch discharge.	19. Date discharge began.	20. Date discharge will begin.
11000	About mo ___ day 1924 yr	Not Applicable mo day yr

21. Describe waste abatement practices.

Demineralizer regenerative solution, boiler blow-down water, and boiler and air heater wash waters are routed to and discharged with the cooling water effluent. (WDISCH)

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PHYSI... DESCRIPTION OF INTAKE WATER AND DISCHARGE

Intake / Discharge

Outfall No.: IL 072 0352

Discharge Serial No.: 001

Parameter and (Code)	(1) UNTREATED INTAKE WATER	TREATED INTAKE WATER	(2) AVERAGE (DAILY)	(3) MINIMUM (OPERATING YEAR)	(4) MAXIMUM (OPERATING YEAR)	(5) SAMPLE FREQUENCY	(6) CONTINUOUS MONITORING	(7)
Flow (Gallons per day) 00056 00058	N/A		629,976	629,962	481,250	875,000	Est. from pump capacity	ABS
pH 00400	"		8.1	7.8	7.8	8.2	CTUR **	ABS
Temperature (Winter) (°F) 74028 Dec 70 - Feb 71	"		39	47	36	60	CONT	ABS
Temperature (Summer) (°F) 74027 Jul - Sept 70	"		62	73	56	94	CONT	ABS

23. Concentration added to DISCHARGE CONTENTS by Plant Operation

PARAMETER	PRESENT	ABSENT	PARAMETER	PRESENT	ABSENT	PARAMETER	PRESENT	ABSENT
Color * 00030		X	Aluminum 01105	X		Nickel * 01067		X
Turbidity 00070	X		Antimony * 01097		X	Selenium* 01147		X
Radioactivity * 74050		X	Arsenic * 01002		X	Silver * 01077		X
Hardness 00900	X		Beryllium * 01012		X	Potassium * 00937		X
Solids 00500	X		Barium * 01007		X	Sodium 00929	X	
Ammonia 00610	X		Boron * 01022		X	Titanium * 01152		X
Organic Nitrogen 00605	X		Cadmium * 01027		X	Tin * 01102		X
Nitrate 00620	X		Calcium 00916	X		Zinc * 01092		X
Nitrite 00615		X	Cobalt * 01037		X	Algicides 74051		X
Phosphorus 00665	X		Chromium * 01011		X	Oil and Grease * 00560		X
Sulfate 00945	X		Copper * 01042		X	Phenols 32730		X
Sulfide 00935		X	Iron 01045	X		Surfactants * 38260		X
Sulfite * 00740		X	Lead * 01051		X	Chlorinated Hydrocarbons 78032		X
Bromide 71870		X	Magnesium 01027	X		Pesticides 39514		X
Chloride 01130	X		Manganese * 01055		X	Total Coliform Bacteria 74055		X
Cyanide 00720		X	Mercury * 71900		X	Coliform Bacteria 74056		X
Fluoride 00951		X	Tetal Strontium * 00931		X			

USEPA Form 4345-R (Rev 7-73) May be Annual Basis

** Based on four samples.

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24. a. All known hazardous or potentially hazardous substances in your plant have been identified? [X] Yes [ ] No

b. If yes, have steps been taken to insure that there exists no possibility of any such known hazardous or potentially hazardous substance enter this discharge? [X] Yes [ ] No

25. Remarks.

See attached

The information above completes the basic reporting requirements which are required of all applicants. Those applicants whose discharge results from an activity included within any of the Standard Industrial Classification Code (SIC Code) categories listed below must complete Part A of this Form as well.

CRITICAL INDUSTRIAL GROUPS

SIC	098	FISH HATCHERIES, FARMS, AND PRESERVES
SIC	10-14	DIVISION B – MINING
SIC	201	MEAT PRODUCTS
SIC	202	DAIRY PRODUCTS
SIC	203	CANNED PRESERVED FRUITS, VEGETABLES (EXCEPT SEAFOODS, SIC 2031 AND 2036)
SIC	2031, 2036	CANNED AND CURED FISH AND SEAFOODS; FRESH OR FROZEN PACKAGED FISH AND SEAFOODS
SIC	204	GRAIN MILL PRODUCTS
SIC	205	SUGAR
SIC	207	CONFECTIONARY AND RELATED PRODUCTS
SIC	208	BEVERAGES
SIC	209	MISCELLANEOUS FOOD PREPARATIONS AND KINDRED PRODUCTS
SIC	22	TEXTILE MILL PRODUCTS
SIC	23	APPAREL AND OTHER FINISHED PRODUCTS MADE FROM FABRICS AND SIMILAR MATERIALS
SIC	242	SAWMILLS AND PLANING MILLS
SIC	2432	VENEER AND PLYWOOD
SIC	2491	WOOD PRESERVING
SIC	26	PAPER AND ALLIED PRODUCTS
SIC	281	INDUSTRIAL INORGANIC AND ORGANIC CHEMICALS (EXCEPT SIC 2818)
SIC	2818	INDUSTRIAL ORGANIC CHEMICALS
SIC	282	PLASTICS MATERIALS AND SYNTHETIC RESINS, SYNTHETIC RUBBER, SYNTHETIC AND OTHER MAN-MADE FIBERS, EXCEPT GLASS
SIC	283	DRUGS
SIC	284	SOAP, DETERGENTS, AND CLEANING PREPARATIONS, PERFUMES, COSMETICS, AND OTHER TOILET PREPARATIONS
SIC	285	PAINTS, VARNISHES, LACQUERS, ENAMELS, AND ALLIED PRODUCTS
SIC	2871	FERTILIZERS
SIC	2879	AGRICULTURAL PESTICIDES, AND OTHER AGRICULTURAL CHEMICALS, NOT ELSEWHERE CLASSIFIED
SIC	2891	ADHESIVES AND GELATIN
SIC	2892	EXPLOSIVES
SIC	29	PETROLEUM REFINING AND RELATED INDUSTRIES
SIC	3011, 3069	TIRES AND INNER TUBES; FABRICATED RUBBER PRODUCTS, NOT ELSEWHERE CLASSIFIED
SIC	3079	MISCELLANEOUS PLASTICS PRODUCTS
SIC	311	LEATHER TANNING AND FINISHING
SIC	32	STONE, CLAY, GLASS, AND CONCRETE PRODUCTS
SIC	331	BLAST FURNACES, STEEL WORKS, AND ROLLING AND FINISHING MILLS
SIC	332	IRON AND STEEL FOUNDRIES
SIC	333, 334	PRIMARY SMELTING AND REFINING OF NONFERROUS METALS; SECONDARY SMELTING AND REFINING OF NONFERROUS METALS
SIC	336	NONFERROUS FOUNDRIES
SIC	347	COATING, ENGRAVING, AND ALLIED SERVICES
SIC	35	MACHINERY, EXCEPT ELECTRICAL
SIC	36	ELECTRICAL MACHINERY, EQUIPMENT, AND SUPPLIES
SIC	37	TRANSPORTATION EQUIPMENT (EXCEPT SHIP BUILDING AND REPAIRING, SIC 3731)
SIC	3731	SHIP BUILDING AND REPAIRING
SIC	491	ELECTRIC COMPANIES AND SYSTEMS
SIC	493	COMBINATION COMPANIES AND SYSTEMS

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(See Part A for estimated quantities of solids added to each discharge)

This plant has a continuous cooling water flow, when operating, averaging 610,000 gpm. Liquid chlorine is added to this intake canal for periods of 10 minutes 4 times a day.

House service water has a continuous flow rate of 25,000 gpm of chlorinated water pumped from the intake canal.

Boiler blowdown is batch discharged at a rate of 130 gpm for about 4 hours once per day.

Demineralizer regenerative wastewater is discharged about 8 times per day at the rate of about 300 gpm for 20 minutes.

Demineralizer filter backwash water is discharged at a rate of 650 gpm for 5 minutes about 6 times a day.

Slag field and settling basin discharges continuously at a rate of 4760 gpm.

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PART A

(Note: Submission of Part A is required of all applicants whose processes are listed on page 3 above.)

(Office use only)

IL 272 0352

Discharge Serial No. 001

INFORMATION REQUIRED OF SPECIFIED INDUSTRIES

Intake ... # ... Discharge, mg/l unless designated lbs

PARAMETER AND CODE	(1) DAILY AVG. CONCENTRATION UNTREATED INTAKE WATER	(2) DAILY AVG. CONCENTRATION TREATED INTAKE WATER	(3) MAXIMUM CONCENTRATION PER PROCESS UNIT	(4) MAXIMUM POUNDS PER DAY	(5) DAILY AVG. CONCENTRATION	(6) AVERAGE POUNDS PER DAY	(7) SAMPLE TYPE	(8) SAMPLE FREQUENCY	(9) METHOD OF ANALYSIS	(10) CONTINUOUS MONITORING	(11)
ALKALINITY (as $CaCO_3$) 00410	N/A	110	110	N/A	0	110	0	AVER	(one or more grab OTHR samples)	STD .M	ABS
B.O.D. 5-DAY 00310	"	3	3	"	0	3	0	"	"	"	"
CHEMICAL OXYGEN DEMAND (C.O.D.) 00340	"	11	11	"	0	11	0	"	"	"	"
TOTAL SOLIDS 00500	"	204	205	"	6239	205	3368	"	"	WQO	"
TOTAL DISSOLVED SOLIDS 70300	"	175	176	"	6217	175	3361	"	"	STD .M	"
TOTAL SUSPENDED SOLIDS 00530	"	29	29	"	15	29	7	"	"	"	"
TOTAL VOLATILE SOLIDS 00505	"	34	34	"	0	34	0	"	"	"	"
AMMONIA (as N) 00610	"	.11	.11	"	0	.11	0	"	"	"	"
KJELDAHL NITROGEN 00625	"	.27	.27	"	0	.27	0	"	"	"	"
NITRATE (as N) 00620	"	.23	.23	"	0	.23	0	"	"	"	"
PHOSPHORUS TOTAL (as P) 00665	"	.21	.21	"	7.59	.21	3.85	"	"	"	"

ENG FORM 4345-1 MAY 71

* Pounds added above background.

** Average of forty samples taken during typical operating da

*** See General Comments 3, 4 at Page 7B-1.1

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PART B. DISCHARGE DESCRIPT

(Note: Submission of Part B is required of all applicants who are also required to submit Part A. Only those parameters specifically indicated in the instructions are to be reported by a particular industry)

(Office use only)

IL 272 0352

Discharge Serial No.

001

B-1. PHYSICAL AND BIOLOGICAL PARAMETERS OF INTAKE WATER AND DISCHARGE (See Table B-1)

	Intake	Discharge					
PARAMETER AND CODE	(1) UNTREATED INTAKE WATER	(2) TREATED INTAKE WATER	(3) AVERAGE (DAILY)	(4) MINIMUM (OPERATING YEAR)	(5) MAXIMUM (OPERATING YEAR)	(6) SAMPLE FREQUENCY	(7) CONTINUOUS MONITORING
COLOR 00080	N/A	N/A	N/A	X	N/A	N/A	N/A
SPECIFIC CONDUCTANCE 00095	"	"	"	N/A	"	"	"
TURBIDITY 00070 JU	"	18	18	X	20 est.	0	A
FECAL STREPTOCOCCI BACTERIA 74054	"	N/A	N/A	X	N/A	N/A	N/A
FECAL COLIFORM BACTERIA 74055	"	"	"	X	"	"	"
TOTAL COLIFORM BACTERIA 74056	"	"	"	X	"	"	"

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PART B

(Office use only)

IL 272 0352

Discharge Serial No.
001

B-2. CHEMICAL PARAMETERS OF INTAKE WATER AND DISCHARGE (See Table B-2)

Intake — Discharge, mg/l unless designated lbs.

PARAMETER AND CODE	UNTREATED INTAKE WATER (1)	TREATED INTAKE WATER (2)	MAXIMUM CONCENTRATION (3)	MAXIMUM POUNDS PER DAY PER PROCESS UNIT (4)	MAXIMUM POUNDS PER DAY (5)	DAILY AVG. CONCENTRATION (6)	AVERAGE POUNDS PER DAY (7)	SAMPLE TYPE (8)	SAMPLE FREQUENCY (9)	METHOD OF ANALYSIS (10)	CONTINUOUS MONITORING (11)
ACIDITY (as $CaCO_3$) 00435	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
TOTAL ORGANIC CARBON (T.O.C.) 00680	"	"	"	"	"	"	"	"	"	"	"
TOTAL HARDNESS 00930	"	149	149	"	0	149	0	A	O	S	A
NITRITE (as N) 00615	"	N/A	N/A	"	N/A	N/A	N/A	N/A	N/A	N/A	N/A
ORGANIC NITROGEN 00605	"	.2	.2	"	0	.2	0	A	O	S	A
PHOSPHORUS-ORTHO (as P) dissolved 70507 all P is ortho	"	.2	.2	"	7.6	.2	3.9	A	O	S	A
SULFATE 00945	"	21.5	22.3	"	5200	21.9	2585	A	O	S	A
SULFIDE 00745	"	N/A	N/A	"	N/A	N/A	N/A	N/A	N/A	N/A	N/A
SULFITE 00749	"	"	"	"	"	"	"	"	"	"	"
BROMIDE 71870	"	"	"	"	"	"	"	"	"	"	"

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Pounds added above background.
Average of forty samples taken during typical operating day.
See General Schemata 3 & 4 at Page B-1.

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PART B

(Office use only)
IL 272 0352

Discharge Serial No.
001

B-2. (cont.) CHEMICAL PARAMETERS OF INTAKE WATER AND DISCHARGE (See Table B-2)

Intake ** Discharge *, mg/l unless designated as lbs or ug/l. *** **** ***** ******

PARAMETER AND CODE	UNTREATED INTAKE WATER (1)	TREATED INTAKE WATER (2)	MAXIMUM CONCENTRATION (3)	MAXIMUM POUNDS PER DAY PER PROCESS UNIT (4)	MAXIMUM POUNDS PER DAY (5)	DAILY AVG. CONCENTRATION (6)	AVERAGE POUNDS PER DAY (7)	SAMPLE TYPE (8)	METHOD OF ANALYSIS (9)	CONTINUOUS MONITORING (10)	(11)
CHLORIDE 00940	N/A	10	10	N/A	439	10	439	A	O	S	A
CYANIDE 00720	"	N/A	N/A	"	N/A	N/A	N/A	N/A	N/A	N/A	N/A
FLUORIDE 00951	"	"	"	"	"	"	"	"	"	"	"
ALUMINUM-TOTAL 01105 ug/l	"	120	120	"	0	120	0	A	O	S	A
ANTIMONY-TOTAL 01097	"	N/A	N/A	"	N/A	N/A	N/A	N/A	N/A	N/A	N/A
ARSENIC-TOTAL 01002	"	"	"	"	"	"	"	"	"	"	"
BARIUM-TOTAL 01007	"	"	"	"	"	"	"	"	"	"	"
BERYLLIUM-TOTAL 01012	"	"	"	"	"	"	"	"	"	"	"
BORON-TOTAL 01022	"	"	"	"	"	"	"	"	"	"	"
CADMIUM-TOTAL 01027	"	"	"	"	"	"	"	"	"	"	"

ENG FORM 4345-1 JUN 71

* Pounds added above background.
** Average of forty samples taken during typical operating days
*** See General Comments E, 4 at Page TB-1.1.

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PART B

NPDES Permit No.
IL 272 0352

Discharge Serial No.
001

B-2. (cont.) CHEMICAL PARAMETERS OF INTAKE WATER AND DISCHARGE (See Table B-2)

Intake / Discharge) mg/l unless designated as lbs or ug/l.

PARAMETER AND CODE	UNTREATED INTAKE WATER (1)	TREATED INTAKE WATER (2)	MAXIMUM CONCENTRATION (3)	MAXIMUM POUNDS PER DAY PER PROCESS UNIT (4)	MAXIMUM POUNDS PER DAY (5)	DAILY AVG. CONCENTRATION (6)	AVERAGE POUNDS PER DAY (7)	SAMPLE TYPE (8)	SAMPLE FREQUENCY (9)	METHOD OF ANALYSIS (10)	CONTINUOUS MONITORING (11)
CALCIUM-TOTAL 00916	N/A	35.5	35.5	N/A	0	35.5	0.	A	O	S	A
CHROMIUM-TOTAL 01034 ug/l	"	4	4	"	0	4	0	A	O	S	A
COBALT-TOTAL 01037	"	N/A	N/A	"	N/A	N/A	N/A	N/A	N/A	N/A	N/A
COPPER-TOTAL 01042	"	"	"	"	"	"	"	"	"	"	"
IRON-TOTAL 01045 ug/l	"	420	420	"	0	420	0	A	O	S	A
LEAD-TOTAL 01051	"	N/A	N/A	"	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MAGNESIUM-TOTAL 00927	"	16	17	"	0	17	0	A	O	O	A
MANGANESE-TOTAL 01055	"	N/A	N/A	"	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MERCURY-TOTAL 71900	"	"	"	"	"	"	"	"	"	"	"
MOLYBDENUM-TOTAL 01062	"	"	"	"	"	"	"	"	"	"	"

EPA FORM 3345-1 JUN 71

* Pounds added above background.
** Average of forty samples taken during typical operating day
*** See General Comments 3, 4 on Page 7B-1.

(Revised 5-10-72) Waukegan

PART B

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IL 272 0352

Discharge No.
001

B-2. (cont.) CHEMICAL PARAMETERS OF INTAKE WATER AND DISCHARGE (See Table B-2)

Intake | Discharge, mg/l unless designated as lbs or ug/l

PARAMETER AND CODE	(1) UNTREATED INTAKE WATER	(2) TREATED INTAKE WATER	(3) MAXIMUM CONCENTRATION	(4) MAXIMUM POUNDS PER PROCESS UNIT	(5) MAXIMUM POUNDS PER DAY	(6) DAILY AVG. CONCENTRATION	(7) AVERAGE POUNDS PER DAY	(8) SAMPLE TYPE	(9) METHOD OF ANALYSIS	(10) SAMPLE FREQUENCY	(11) CONTINUOUS MONITORING
NICKEL-TOTAL 01057	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
POTASSIUM-TOTAL 00937	"	1.37	1.37	"	0	1.37	0	A	O	S	A
SELENIUM-TOTAL 01147	"	N/A	N/A	"	N/A	N/A	N/A	N/A	N/A	N/A	N/A
SILVER-TOTAL 01077	"	"	"	"	"	"	"	"	"	"	"
SODIUM-TOTAL 00929	"	6	6	"	600	6	325	A	O	O	A
THALLIUM-TOTAL 01059	"	N/A	N/A	"	N/A	N/A	N/A	N/A	N/A	N/A	N/A
TIN-TOTAL 01102	"	"	"	"	"	"	"	"	"	"	"
TITANIUM-TOTAL 01152	"	"	"	"	"	"	"	"	"	"	"
ZINC-TOTAL 01092 ug/l	"	26	26	"	0	26	0	A	O	O	A
OIL AND GREASE 00550	"	N/A	N/A	"	N/A	N/A	N/A	N/A	N/A	N/A	N/A

ENG FORM 4345-1 JUN 71

* Pounds added above background.
** Average of forty samples taken during typical operating days.
*** See General Comments 3, 4 at Page 7B-1.1

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PART B

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I. IL 272 0352

Discharge Serial No.

001

B-2. (cont.) CHEMICAL PARAMETERS OF INTAKE WATER AND DISCHARGE (See Table B-2)

	Intake		Discharge									
PARAMETER AND CODE	(1) UNTREATED INTAKE WATER	(2) TREATED INTAKE WATER	(3) MAXIMUM CONCENTRATION	(4) MAXIMUM POUNDS PER DAY PER PROCESS UNIT	(5) MAXIMUM POUNDS PER DAY	(6) DAILY AVG. CONCENTRATION	(7) AVERAGE POUNDS PER DAY	(8) SAMPLE TYPE	(9) SAMPLE FREQUENCY	(10) METHOD OF ANALYSIS	(11) CONTINUOUS MONITORING
PHENOLS 32730	N/A	W	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
SURFACTANTS 38260	"	N/A	"	"	"	"	"	"	"	"	"
ALGICIDES* 74051	"	"	"	"	"	"	"	"	"	"	"
CHLORINATED HYDRO-CARBONS* (EXCEPT PESTICIDES) 74052	"	"	"	"	"	"	"	"	"	"	"
PESTICIDES* 74053	"	"	"	"	"	"	"	"	"	"	"

*Name specific compound(s) and fill in the required data for each. Use extra blanks at the end of the form and the "Remarks" space as necessary.

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PART B

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IL 272 0352

Discharge Serial No.
001

B-3. RADIOACTIVE PARAMETERS OF INTAKE WATER AND DISCHARGE (See Table B-3)

	Intake	Discharge						
PARAMETER AND CODE	UNTREATED INTAKE WATER (1)	TREATED INTAKE WATER (2)	AVERAGE (DAILY) (3)	MINIMUM (OPERATING YEAR) (4)	MAXIMUM (OPERATING YEAR) (5)	SAMPLE FREQUENCY (6)	CONTINUOUS MONITORING (7)
ALPHA-TOTAL 01501	N/A	N/A	N/A	X	N/A	N/A	N/A
ALPHA COUNTING ERROR 01502	"	"	"	X	"	"	"
BETA-TOTAL 03501	"	"	"	X	"	"	"
BETA COUNTING ERROR 03502	"	"	"	X	"	"	"
GAMMA-TOTAL 05501	"	"	"	X	"	"	"
GAMMA COUNTING ERROR 05502	"	"	"	X	"	"	"
TRITIUM-TOTAL 07000	"	"	"	X	"	"	"
TRITIUM COUNTING ERROR 07001	"	"	"	X	"	"	"

B-4. REMARKS N/A; Not applicable.
O; If posted in Part B, B-2, Column (10), indicates analysis by atomic absorption spectrophotometric techniques preceded by the chelation-extraction procedure when necessary. If posted in Part B, B-1, Column (6), or Part B, B-2, Column (9), indicates one or more grab Samples.

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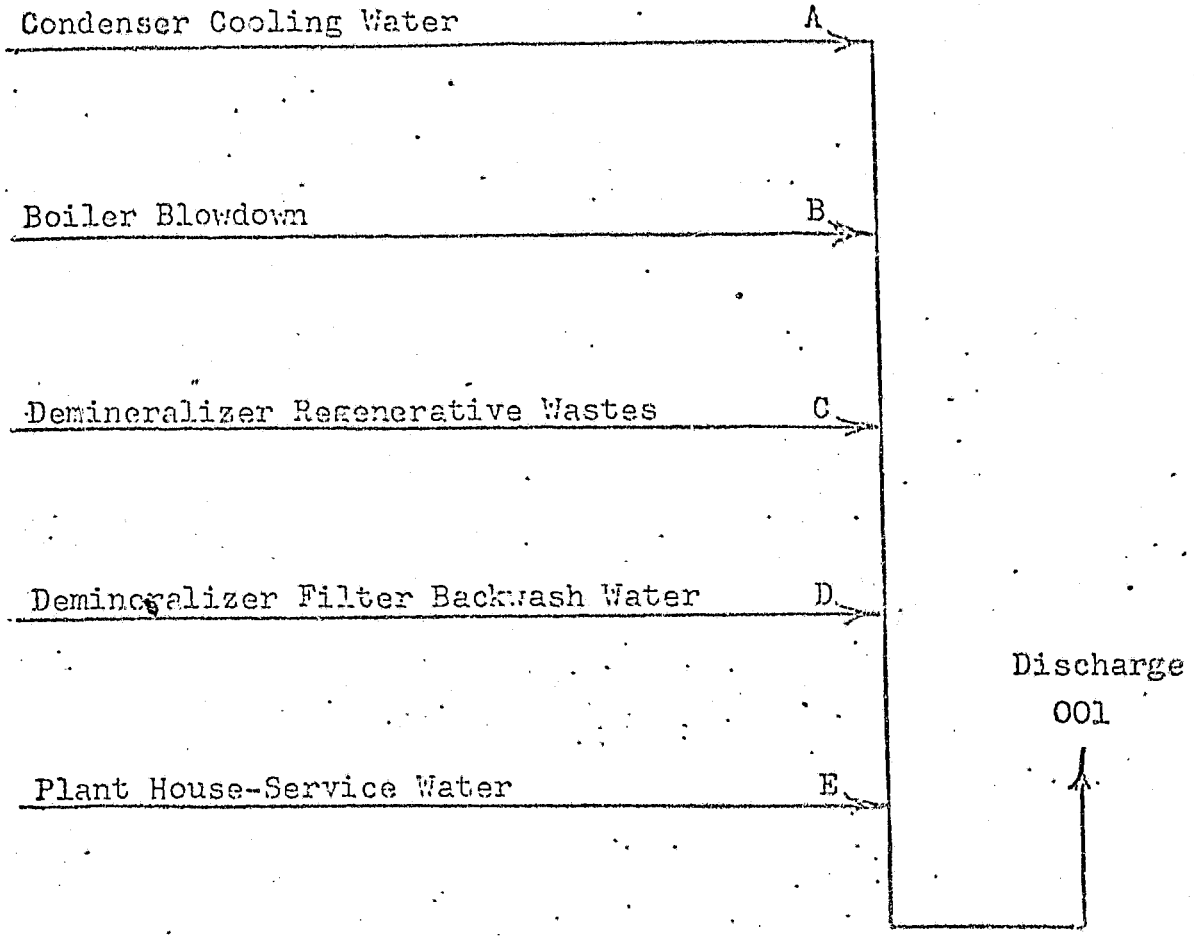
Index Chart for Discharge



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GENERAL COMMENTS:

1. Transformer cooling water, air compressor cooling water, and intake screen back-wash water are also directed into the discharge. No separate analysis has been made of these streams; however, they contain no waste additions not contained in background (intake) water. The back-wash from the screens is directed into a trash basket, and those materials collected are appropriately disposed of off-site.

2. Numerous floor drains from various portions of the plant are discharged to the cooling water stream at various points throughout the plant property. Some floor drains are first routed to sumps before discharge. This water represents leaks from the individual process and treatment systems described herein, and is covered by the descriptions of flows and concentrations in these systems.

3. Average discharge concentration is the sum of the average inlet concentration and the concentration increased above the background due to the addition of the particular constituent for station operation.

4. To calculate maximum concentrations in the principal discharge (#001), it was assumed that all process streams added to the cooling water were being discharged at their maximum flow rate and concentration at the same time while cooling water was flowing at its minimum rate. However, such occasion is highly unlikely to occur. The minimum flow rate is the lowest flow rate at which the station can maintain operation of the units.

The amounts of solids collected in the demineralizer resins are calculated in order to determine the maximum discharge concentrations during regeneration. (Although these and background chemicals in the wash are present in the demineralizer regenerative waste process stream, only sulfate and sodium, from sulfuric acid and sodium hydroxide used in the process, are added above background. Thus, only these are included in average discharge concentrations and daily pounds added.)

5. Boilers have been acid cleaned about once every five years. In the future they are expected to be cleaned every two or three years. The wash will not be discharged. Plans are to dispose of the wash off-site, or to use compounds for cleaning which can be burned in the boilers.

6. During the course of a year, each unit is non-operational (for lack of demand or maintenance reasons) for varying periods of time ranging from several days to several weeks.

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Commonwealth Edison Company
Sect on - Waukegan
NPDES # IL0002 0356
Disch # 001

PROCESS STREAM Condenser Cooling Water

WATER USAGE DIAGRAM CODE A

AVERAGE DAILY FLOW 610,000 gpm

MAX. FLOW 875,000 gpm MIN. FLOW 481,250 gpm

CONTINUOUS FLOW X (with batch chlorination)

Estimated Weights Added and Concentrations

(Based on weights of chemicals added)

	lbs/day*	Daily Average Conc. mg/l	Maximum Conc. mg/l**
Chloride	427	.06	2.1
Total Dissolved Solids	427	.06	2.1
Total Solids	427	.06	2.1

* Maximum pounds added per day during normal operation.

** Concentration during chlorination.

COMMENTS:

1. Intake water is chlorinated in the intake canal by three chlorinators which add a total of 11.12 pounds per minute of chlorine. Intake water is batch chlorinated for 10 minutes 4 times a day with chlorine gas.

2. Of the 444.8 lb/day chlorine added in the intake canal, 427 lbs/day flow thru the condensers in the 610,000 gpm cooling water. The remaining 17.8 lbs/day enters the 25,000 gpm House-Service Water stream.

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Commonwealth Edison
Public Waukegan
Ditch # 001

PROCESS STREAM Boiler Blowdown

WATER USAGE DIAGRAM CODE B

AVERAGE DAILY FLOW 34 gpm

MAX. FLOW 130 gpm BATCH FLOW X

FREQUENCY batch discharged at a rate of 130 gpm for about 4 hours once per day.

Estimated Weights Added and Concentrations

(Based on weights of chemicals added)

	lbs/day*	Conc., mg/l**
Phosphate	11.68	28.38
Sodium	17.37	42.21
Sulfate	17.71	43.04
Total Dissolved Solids	46.76	113.63
Total Solids	46.76	113.63

* Pounds added during a normal operation.

** Concentrations calculated from the pounds added, based on total gallons per day blowdown.

COMMENTS:

1. The following weights of chemicals are added daily:

Na_3PO_4	20.17 lbs/day	
NaOH	.68 lbs/day	
Na_2SO_4	9.27 lbs/day	
Na_2SO_3	15.03 lbs/day	(at boiler temperatures sulfite converts to sulfate.)

2. Also added are:

Ammonia (NH_3)	1.28 lbs/day
Hydrazine (N_2H_2)	4.29 lbs/day
Morpholine (C_4H_9ON)	5.81 gal/day

Hydrazine, Ammonia, and Morpholine are standard compounds used in boiler water treatment. These additives break down into hydrogen, nitrogen, ammonia and one or more carbon compounds which, along with the ammonia added, are released to the atmosphere.

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(Process stream boiler blowdown continued)

3. The station operates seven generating units with steam produced by three sets or rows of boilers. The boilers blowdown an average of 412,413 lbs/day, (of water). The maximum blowdown rate per boiler is 65,000 lbs/hr. (of water) or 130 gpm.

4. This will be an influent to the discharge stream, and as such will be combined with and diluted by all other waste and cooling water influents to the discharge stream.

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Commonwealth Edison
Sect 1 - Waukegan
NPDES # IL0002
Ditch # 001

PROCESS STREAM Demineralizer Regenerative Wastes

WATER USAGE DIAGRAM CODE C

AVERAGE DAILY FLOW 32 gpm

MAX. FLOW 2000 gpm (est.) BATCH FLOW X

FREQUENCY: about 8 times per day at the rate of about 300 gpm for 20 minute

Estimated Weights Added and Concentrations

	lbs/day*	Conc., mg/l**
Source of total dissolved solids:		
Added as Na and SO_4 for regeneration purposes:		
Sulfate	2568	6780
Sodium	308	813
Total Solids Added	2876	7593
Solids removed from lake intake water during the demineralization process and returned during regeneration:		
Calcium	111.8	295
Magnesium	50.4	133
Chloride	44.1	116
Potassium	4.3	11
Sulfate	67.7	178
Sodium	19.8	52
Other Trace Elements	7.5	19
Total Solids Discharged	3181.6	8397

* Pounds added when operating, as chemicals, or pounds released from the ion exchange resin during the regeneration.

** Calcula[illegible]unds added, based on total gallons per day. Thus [illegible]oncentration when the demineralizer is regenerate[illegible]

COMMENTS:

1. This will be an influent to the discharge stream, and as such will be combined with and diluted by all other waste and cooling water influents to the discharge stream.

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2. Dissolved solids held by resins from intake lake water during demineralization and released to lake discharge water during regeneration each day do not constitute an addition of chemicals from the station.

3. Added SO_4 and Na were based on the average weight of acid and caustic added to the demineralizers and discharged each day.

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PROCESS STREAM Demineralizer Filter Backwash Water

WATER USAGE DIAGRAM CODE D

AVERAGE DAILY FLOW 114.6 gpm

MAX. FLOW 1300 gpm BATCH FLOW X

FREQUENCY 650 gpm for 5 minutes about 6 times a day.

Estimated Weights Added and Concentrations

	lbs/day*	Conc., mg/l**
Source of Solids:		
Added for Coagulation:		
Dissolved Solids (from Nalco)	3.00	2.18
$Al(OH)_3$ (from Alum)	3.68	2.67
Total Solids Added	6.68	4.85
Total Suspended Solids sand filtered out of intake water and returned with backwash water:		
Suspended Solids	90.30	70.66
Total Solids Discharged	96.98	75.51

* Pounds added when operating, as chemicals, or pounds filtered out and returned during backwash.

** Calculated from pounds added, based on total gallons per day. Thus, it is the concentration when the filters are being backwashed.

COMMENTS:

1. This will be an influent to the discharge stream, and as such will be combined with and diluted by all other waste and cooling water influents to the discharge stream.

2. "Nalco 600," a cationic electrolyte, and Alum, $Al_2(SO_4)_3 \cdot 14\ H_2O$ are added to the influent water before passing through the filter to flocculate the filterable solids. Average pounds of Nalco and Alum added per day were used to calculate pounds of solids added. The total weight of Nalco was assumed added as solids. The Alum forms Aluminum Hydroxide with the back-wash water and is added as solids.

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Commonwealth Edison
Station Waukegan
Ace # IL 272 0352
Disch # 001

PROCESS STREAM Plant House-Service Water Discharge

WATER USAGE DIAGRAM CODE E

AVERAGE DAILY FLOW 16,800 gpm

MAX. FLOW 16,800 gpm CONTINUOUS FLOW X (with batch chlorination for 10 minutes 4 times per day with chlorine gas)*

Estimated Weights Added and Concentrations

	lbs/day**	Daily Average Conc., mg/l	Maximum Conc., mg/l***
Chloride	12.0	.059	2.1
Total Dissolved Solids	12.0	.059	2.1
Total Solids	12.0	.059	2.1

* This water is drawn from the plant intake water after the point of chlorination.

** Maximum pounds added per day during normal operation.

*** Concentration during chlorination.

COMMENTS:

1. This discharge enters and is diluted by other effluents in the cooling water discharge canal.

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Commonwealth Edison
Sect. A Waukegan
NPDES # IL 272 0352
Disch # 002

PROCESS STREAM: Slag Field and Settling Basin Discharge

WATER USAGE DIAGRAM CODE: None - individual discharge

AVERAGE DAILY FLOW: 4760 GPM

MAX. FLOW: 6487 CONTINUOUS FLOW: X

Estimated Weights Added and Concentrations

(Based two slag field and settling basin samples taken during normal operation)

	Added lbs/day* (Above background)	Conc., mg/l**
Alkalinity	0	95
B.O.D.	0	1.10
C.O.D.	0	5.0
Total solids	4514	283
Total dissolved solids	4286	250
Total suspended solids	57	30
Total volatile solids	686	46
Turbidity (JU)	N/A	2
Ammonia (as N)	2.46	0.07
Kjeldahl Nitrogen	0	0.13
Nitrate	5.14	0.32
Phosphate	0	0.16
Hardness	3486	200
Calcium	943	52
Magnesium	0	14
Organic Nitrogen	0	0.08
Sulfate	5629	120
Chloride	480	18
Aluminum	77	1470
Chromium	.05	5
Iron	33	1000
Sodium	154.3	9
Potassium	87.4	2.9
Zinc	1.71	56

* Pounds added per day (above background) were calculated by subtracting the lake intake concentrations from the Settling Basin concentrations and multiplying by the discharge flo

** Average of two Slag Field and Settling Basin discharg

COMMENTS:

1. Average concentration is the average of the two sample concentration is the result of discharging the maximum pounds per when the flow is at its minimum rate throughout the day.

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Waukegan

SECTION II. PLANT PROCESS AND DISCHARGE DESCRIPTION

1. Discharge described below is a. Present [X] b. Proposed (new or changed) [ ]	2. Implementation schedule [ ]	(Office use only) IL 272 0352

Name of corporate boundaries within which the point of discharge is located. State	County	City or Town	3. Discharge Serial No.
3. Illinois	4. Lake	5. Waukegan	002

State the precise location of the point of discharge.	9. Name of waterway at the point of discharge.
7. Latitude 4 2 Degrees; 2 3 Min; 0 0 Sec.	Lake Michigan
8. Longitude 8 7 Degrees; 4 8 Min; 3 0 Sec.	

10. Has application for water quality certification or description of impact been made? If so, give date:

Date	Check if certificate is attached to form	Name Issuing Agency
7 mo 1 day 71 yr	[ ]	Illinois Environmental Protection Agency

11. Narrative description of activity (include terms of general 4-digit Standard Industrial Classification, and specific manufacturing process).

Electric Companies and Systems
The process consists of producing steam in coal and/or gas and oil-fueled boilers to drive generators that produce electricity for distribution to customers.
The Waukegan plant contains 9 steam boilers and seven generators which have a net capacity of 1047 MW. This plant operated at 55.1% of its capacity in 1970.

12. Standard industrial classification number.	13. Principal product.	14. Amount of principal product produced per day.
SIC #491	Electricity	14,100 MWH

15. Principal raw material.	16. Amount of principal raw material consumed per day.	17. Number of batch discharges per day.
Coal	5,240 Tons	Not Applicable
Gas	312,000 Therms	
Oil	6910	

18. Average gallons per batch discharge.	19. Date discharge began.	20. Date discharge will begin.
Not Applicable	About mo — day — 1924 yr	Not Applicable mo — day — yr

21. Describe waste abatement practices.

Ash and slag-coal combustion products are sluiced to the slag-ash field situated just north of the plant. Suspended solids are settled (PSEDIM) from this water, and the decant water over-flows (WDISCH) to a drainage canal to Lake Michigan.

EPA FORM 3510-1 (REV. 5-71)

(Revised 5-9-72) Waukegan

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Intake / Discharge

(Office use only) IL 272 0352

Discharge Serial No. 002

Parameter and Code	(1) UNTREATED INTAKE WATER	(1) TREATED INTAKE WATER	(2) AVERAGE (DAILY)	(3) MINIMUM (OPERATING YEAR)	(4) MAXIMUM (OPERATING YEAR)	(5) SAMPLE FREQUENCY	(6) CONTINUOUS MONITORING	(7)
Flow (Gallons per day) 00056 00058		N/A	4760	4760	1050est.	6478	(Based on pump OTHR capacities)	ABS
pH 00400		"	8.1	7.7 **	7.5 **	7.9 **	OTHR **	ABS
Temperature (Winter) (°F) 74028		"	42	42	35 est.	60	OTHR ***	ABS
Temperature (Summer) (°F) 74027		"	60	60	45	75	OTHR ***	ABS

23. Concentration added to DISCHARGE CONTENTS by Plant Operation

PARAMETER	PRESENT	ABSENT	PARAMETER	PRESENT	ABSENT	PARAMETER	PRESENT	ABSENT
Color * 00030		X	Aluminum 01105	X		Nickel * 01067		X
Turbidity 00070	X		Antimony * 01097		X	Selenium * 01147		X
Radioactivity * 74050		X	Arsenic * 01002		X	Silver * 01077		X
Hardness 00900	X		Beryllium * 01012		X	Potassium * 00937		X
Solids 00500	X		Barium * 01007		X	Sodium 00929	X	
Ammonia 00610	X		Boron * 01022		X	Titanium * 01152		X
Organic Nitrogen 00605	X		Cadmium * 01027		X	Tin * 01102		X
Nitrate 00620	X		Calcium 00916	X		Zinc * 01092		X
Nitrite 00615		X	Cobalt * 01037		X	Algicides 74051		X
Phosphorus 00665	X		Chromium * 01034		X	Oil and Grease * 00550		X
Sulfate 00945	X		Copper * 01042		X	Phenols * 32730		X
Sulfide 00745		X	Iron 01045	X		Surfactants * 38260		X
Sulfite * 00740		X	Lead * 01051		X	Chlorinated Hydrocarbons 74052		X
Bromide 71870		X	Magnesium 00927	X		Pesticides 74053		X
Chloride 00940	X		Manganese * 01055		X	Fecal Streptococci Bacteria 74054		X
Cyanide 00720		X	Mercury * 71900		X	Coliform Bacteria 74056		X
Fluoride 00951		X	Molybdenum * 01062		X			

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* May be Incidental Trace

** Based on two samples taken on typical operating days

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[X] Yes [ ] No 2720952

24b. If yes, have steps been taken to insure that there exists no possibility of any such known hazardous or potentially hazardous substance entering this discharge?

[X] Yes [ ] No

25. Remarks.

See attached

The information above completes the basic reporting requirements which are required of all applicants. Those applicants whose discharge results from an activity included within any of the Standard Industrial Classification Code (SIC Code) categories listed below must complete Part A of this form as well.

CRITICAL INDUSTRIAL GROUPS

SIC	098	FISH HATCHERIES, FARMS, AND PRESERVES
SIC	10-14	DIVISION B — MINING
SIC	201	MEAT PRODUCTS
SIC	202	DAIRY PRODUCTS
SIC	203	CANNED PRESERVED FRUITS, VEGETABLES (EXCEPT SEAFOODS, SIC 2031 AND 2036)
SIC	2031, 2036	CANNED AND CURED FISH AND SEAFOODS; FRESH OR FROZEN PACKAGED FISH AND SEAFOODS
SIC	204	GRAIN MILL PRODUCTS
SIC	206	SUGAR
SIC	207	CONFECTIONARY AND RELATED PRODUCTS
SIC	208	BEVERAGES
SIC	209	MISCELLANEOUS FOOD PREPARATIONS AND KINDRED PRODUCTS
SIC	22	TEXTILE MILL PRODUCTS
SIC	23	APPAREL AND OTHER FINISHED PRODUCTS MADE FROM FABRICS AND SIMILAR MATERIALS
SIC	242	SAWMILLS AND PLANING MILLS
SIC	2432	VENEER AND PLYWOOD
SIC	2491	WOOD PRESERVING
SIC	26	PAPER AND ALLIED PRODUCTS
SIC	281	INDUSTRIAL INORGANIC AND ORGANIC CHEMICALS (EXCEPT SIC 2818)
SIC	2818	INDUSTRIAL ORGANIC CHEMICALS
SIC	282	PLASTICS MATERIALS AND SYNTHETIC RESINS, SYNTHETIC RUBBER, SYNTHETIC AND OTHER MAN-MADE FIBERS, EXCEPT GLASS
SIC	283	DRUGS
SIC	284	SOAP, DETERGENTS, AND CLEANING PREPARATIONS, PERFUMES, COSMETICS, AND OTHER TOILET PREPARATIONS
SIC	285	PAINTS, VARNISHES, LACQUERS, ENAMELS, AND ALLIED PRODUCTS
SIC	2871	FERTILIZERS
SIC	2879	AGRICULTURAL PESTICIDES, AND OTHER AGRICULTURAL CHEMICALS, NOT ELSEWHERE CLASSIFIED
SIC	2891	ADHESIVES AND GELATIN
SIC	2892	EXPLOSIVES
SIC	29	PETROLEUM REFINING AND RELATED INDUSTRIES
SIC	3011, 3069	TIRES AND INNER TUBES; FABRICATED RUBBER PRODUCTS, NOT ELSEWHERE CLASSIFIED
SIC	3079	MISCELLANEOUS PLASTICS PRODUCTS
SIC	311	LEATHER TANNING AND FINISHING
SIC	32	STONE, CLAY, GLASS, AND CONCRETE PRODUCTS
SIC	331	BLAST FURNACES, STEEL WORKS, AND ROLLING AND FINISHING MILLS
SIC	332	IRON AND STEEL FOUNDRIES
SIC	333, 334	PRIMARY SMELTING AND REFINING OF NONFERROUS METALS; SECONDARY SMELTING AND REFINING OF NONFERROUS METALS
SIC	336	NONFERROUS FOUNDRIES
SIC	347	COATING, ENGRAVING, AND ALLIED SERVICES
SIC	35	MACHINERY, EXCEPT ELECTRICAL
SIC	36	ELECTRICAL MACHINERY, EQUIPMENT, AND SUPPLIES
SIC	37	TRANSPORTATION EQUIPMENT (EXCEPT SHIP BUILDING AND REPAIRING, SIC 3731)
SIC	3731	SHIP BUILDING AND REPAIRING
SIC	491	ELECTRIC COMPANIES AND SYSTEMS
SIC	493	COMBINATION COMPANIES AND SYSTEMS

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(Note: Submission of [illegible] on page 3 above.)

IL 272 0352

Discharge Serial No. 002

INFORMATION REQUIRED OF SPECIFIED INDUSTRIES

Intake *** | Discharge, mg/l unless designated lbs

PARAMETER AND CODE	(1) DAILY AVG. CONCENTRATION UNTREATED INTAKE WATER	(2) DAILY AVG. CONCENTRATION TREATED INTAKE WATER	(3) MAXIMUM CONCENTRATION PER PROCESS UNIT	(4) MAXIMUM POUNDS PER DAY PER PROCESS UNIT	(5) DAILY AVG. CONCENTRATION	(6) AVERAGE POUNDS PER DAY	(7) SAMPLE TYPE	(8) SAMPLE FREQUENCY	(9) METHOD OF ANALYSIS	(10) CONTINUOUS MONITORING	(11)
ALKALINITY (as $CaCO_3$) 00410	N/A	110	95	N/A	0	95	0	AVER	(Qty or Conc) AVER sample	STD.M	ABS
B.O.D. 5-DAY 00310	"	3	1	"	-140	1	-103	"	"	"	"
CHEMICAL OXYGEN DEMAND (C.O.D.) 00340	"	11	5	"	-428	5	-314	"	"	"	"
TOTAL SOLIDS 00500	"	204	283	"	6152	283	4514	"	"	WQO	"
TOTAL DISSOLVED SOLIDS 70300	"	175	250	"	5841	250	4286	"	"	STD.M	"
TOTAL SUSPENDED SOLIDS 00530	"	29	30	"	78	30	57	"	"	"	"
TOTAL VOLATILE SOLIDS 00505	"	34	46	"	935	46	686	"	"	"	"
AMMONIA (as N) 00610	"	.11	.07	"	-3.35	.07	-2.46	"	"	"	"
KJELDAHL NITROGEN 00625	"	.27	.13	"	-10.90	.13	-8.00	"	"	"	"
NITRATE (as N) 00620	"	.23	.32	"	7.00	.32	5.14	"	"	"	"
PHOSPHORUS TOTAL (as P) 00665	"	.21	.20	"	-1.32	.16	-.96	"	"	"	"

* Pounds added above background.

ENG FORM 4345-1 MAY 71 ** Average of forty samples taken during typical operating da

*** See Notes on Page 7B-7.

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PART B DISCHARGE DESCRIPTIC

(Note: Submission of Part B is required of all applicants who are also required to submit Part A. Only those parameters specifically indicated in the instructions are to be reported by a particular industry)

(Office use only)

IL 272 0352

Discharge Serial No.

002

B-1. PHYSICAL AND BIOLOGICAL PARAMETERS OF INTAKE WATER AND DISCHARGE (See Table B-1)

	Intake	Discharge						
PARAMETER AND CODE	UNTREATED INTAKE WATER (1)	TREATED INTAKE WATER (2)	AVERAGE (DAILY) (3)	MINIMUM (OPERATING YEAR) (4)	MAXIMUM (OPERATING YEAR) (5)	SAMPLE FREQUENCY (6)	CONTINUOUS MONITORING (7)
COLOR 00080	N/A	N/A	N/A	X	N/A	N/A	N/A
SPECIFIC CONDUCTANCE 00095	"	"	"	N/A	"	"	"
TURBIDITY 00070 JU	"	18	2	X	3	0	A
FECAL STREPTOCOCCI BACTERIA 74054	"	N/A	N/A	X	N/A	N/A	N/A
FECAL COLIFORM BACTERIA 74055	"	"	"	X	"	"	"
TOTAL COLIFORM BACTERIA 74056	"	"	"	X	"	"	"

ENG FORM 4345-1 JUN 71

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PART B

(Office use only) IL 272 0352

Discharge Serial No. 002

B-2. CHEMICAL PARAMETERS OF INTAKE WATER AND DISCHARGE (See Table B-2)

Intake | Discharge, mg/l unless designated lbs.

PARAMETER AND CODE	(1) UNTREATED INTAKE WATER	(2) TREATED INTAKE WATER	(3) MAXIMUM CONCENTRATION	(4) MAXIMUM POUNDS PER DAY PER PROCESS UNIT	(5) DAILY AVG. CONCENTRATION	(6) AVERAGE POUNDS PER DAY	(7) SAMPLE TYPE	(8) METHOD OF ANALYSIS	(9) SAMPLE FREQUENCY	(10) CONTINUOUS MONITORING	(11)
ACIDITY (as $CaCO_3$) 00435	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
TOTAL ORGANIC CARBON (T.O.C.) 00680	"	"	"	"	"	"	"	"	"	"	"
TOTAL HARDNESS 00900	"	145	272	"	4751	200	3486	A	O	S	A
NITRITE (as N) 00615	"	N/A		"	N/A	N/A	N/A	N/A	N/A	N/A	N/A
ORGANIC NITROGEN 00605	"	.2	.1	"	.1	.1	3.4	A	O	S	A
PHOSPHORUS ORTHO (as P) 70507 assumed all P is ortho	"	.2	.2	"	-1.3	.2	-1.0	A	O	S	A
SULFATE 00945	"	21.5	163.2	"	7671.2	120.0	5629.0	A	O	S	A
SULFIDE 00745	"	N/A	N/A	"	N/A	N/A	N/A	N/A	N/A	N/A	N/A
SULFITE 00740	"	"	"	"	"	"	"	"	"	"	"
BROMIDE 71870	"	"	"	"	"	"	"	"	"	"	"

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** Pounds added above background.

*** Average of forty Samples taken during typical operating days.

See Notes at Page 7B-7.

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Discharge Serial No.
001

B-2. (cont.) CHEMICAL PARAMETERS OF INTAKE WATER AND DISCHARGE (See Table B-2)

Intake *** Discharge ***, mg/l unless designated as lbs or ug/l

PARAMETER AND CODE	UNTREATED INTAKE WATER (1)	TREATED INTAKE WATER (2)	MAXIMUM CONCENTRATION (3)	MAXIMUM POUNDS PER DAY PER PROCESS UNIT (4)	MAXIMUM POUNDS PER DAY (5)	DAILY AVG. CONCENTRATION (6)	AVERAGE POUNDS PER DAY (7)	SAMPLE TYPE (8)	METHOD OF ANALYSIS (9)	SAMPLE FREQUENCY (10)	CONTINUOUS MONITORING (11)
CHLORIDE 00940	N/A	10	25	N/A	654	18	480	A	O	S	A
CYANIDE 00720	"	N/A	N/A	"	N/A	N/A	N/A	N/A	N/A	N/A	N/A
FLUORIDE 00951	"	"	"	"	"	"	"	"	"	"	"
ALUMINUM-TOTAL 01105 ug/l	"	120	2000	"	105	1470	77	A	O	S	A
ANTIMONY-TOTAL 01097	"	N/A	N/A	"	N/A	N/A	N/A	N/A	N/A	N/A	N/A
ARSENIC-TOTAL 01002	"	"	"	"	"	"	"	"	"	"	"
BARIUM-TOTAL 01007	"	"	"	"	"	"	"	"	"	"	"
BERYLLIUM-TOTAL 01012	"	"	"	"	"	"	"	"	"	"	"
BORON-TOTAL 01022	"	"	"	"	"	"	"	"	"	"	"
CADMIUM-TOTAL 01027	"	"	"	"	"	"	"	"	"	"	"

EPA FORM 4345-1 JUN 71

* Pounds added above background.
** Average of forty samples taken during typical operating days.
*** See Notes at Page VB-7.

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Discharge Serial No. 002

B-2. (cont.) CHEMICAL PARAMETERS OF INTAKE WATER AND DISCHARGE (See Table B-2)

Intake / Discharge — mg/l unless designated as lbs or ug/l

PARAMETER AND CODE	(1) UNTREATED INTAKE WATER	(2) TREATED INTAKE WATER	(3) MAXIMUM CONCENTRATION	(4) MAXIMUM POUNDS PER DAY PER PROCESS UNIT	(5) DAILY AVG. CONCENTRATION	(6) AVERAGE POUNDS PER DAY	(7) SAMPLE TYPES	(8) METHOD OF ANALYSIS	(9) SAMPLE FREQUENCY	(10) CONTINUOUS MONITORING	(11)
CALCIUM-TOTAL 00916	N/A	35.5	70.6	N/A	129	52.0	943.0	A	O	S	A
CHROMIUM-TOTAL 01034 ug/l	"	4	7	"	0	5	0	A	O	S	A
COBALT-TOTAL 01037	"	N/A	N/A	"	N/A	N/A	N/A	A	A	A	A
COPPER-TOTAL 01042	"	"	"	"	"	"	"	"	"	"	"
IRON-TOTAL 01045 ug/l	"	420	1360	"	1363	33.14	1000	A	O	S	A
LEAD-TOTAL 01051	"	N/A	N/A	"	N/A	N/A	N/A	A	A	A	A
MAGNESIUM-TOTAL 00927	"	16	19.1	"	-155	14	-114	A	O	O	A
MANGANESE-TOTAL 01055	"	N/A	N/A	"	N/A	N/A	N/A	A	A	A	A
MERCURY-TOTAL 71900	"	"	"	"	"	"	"	"	"	"	"
MOLYBDENUM-TOTAL 01062	"	"	"	"	"	"	"	"	"	"	"

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* Pounds added above background.
** Average of forty samples taken during typical operating days.
*** See Notes at Page V-B-7.

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PART B

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IL 272 0352

Discharge Serial No.
002

B-2. (cont.) CHEMICAL PARAMETERS OF INTAKE WATER AND DISCHARGE (See Table B-2)

Intake Discharge, mg/l unless designated as lbs or ug/l

PARAMETER AND CODE	UNTREATED INTAKE WATER (1)	TREATED INTAKE WATER (2)	MAXIMUM CONCENTRATION (3)	MAXIMUM POUNDS PER DAY PER PROCESS UNIT (4)	DAILY AVG. CONCENTRATION (5)	AVERAGE POUNDS PER DAY (6)	MAXIMUM POUNDS PER DAY (7)	SAMPLE TYPE (8)	SAMPLE FREQUENCY (9)	METHOD OF ANALYSIS (10)	CONTINUOUS MONITORING (11)
NICKEL-TOTAL 01067	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
POTASSIUM-TOTAL 00937	"	1.37	3.93	"	119.11	2.90	87.40	A	O	S	A
SELENIUM-TOTAL 01147	"	N/A	N/A	"	N/A	N/A	N/A	N/A	N/A	N/A	N/A
SILVER-TOTAL 01077	"	"	"	"	"	"	"	"	"	"	"
SODIUM-TOTAL 00929	"	6	12	"	210	9.0	154	A	O	O	A
THALLIUM-TOTAL 01059	"	N/A	N/A	"	N/A	N/A	N/A	N/A	N/A	N/A	N/A
TIN-TOTAL 01102	"	"	"	"	"	"	"	"	"	"	"
TITANIUM-TOTAL 01152	"	"	"	"	"	"	"	"	"	"	"
ZINC-TOTAL 01092 ug/l	"	26	76	"	3	56	2	A	O	O	A
OIL AND GREASE 00550	"	N/A	N/A	"	N/A	N/A	N/A	N/A	N/A	N/A	N/A

ENG FORM 4345-1 JUN 71

* Pounds added above background.

** Average of forty samples taken during typical operating days.

See Notes at Page 7B-7.

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PART B

(Office use only)

IL 272 0352

Discharge Serial No. 002

B-2. (cont.) CHEMICAL PARAMETERS OF INTAKE WATER AND DISCHARGE (See Table B-2)

	Intake		Discharge									
PARAMETER AND CODE	UNTREATED INTAKE WATER (1)	TREATED INTAKE WATER (2)	MAXIMUM CONCENTRATION (3)	MAXIMUM POUNDS PER DAY PER PROCESS UNIT (4)	MAXIMUM POUNDS PER DAY (5)	DAILY AVG. CONCENTRATION (6)	AVERAGE POUNDS PER DAY (7)	SAMPLE TYPE (8)	METHOD OF ANALYSIS* (9)	SAMPLE FREQUENCY* (10)	CONTINUOUS MONITORING (11)
PHENOLS 32730	N/A	W	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
SURFACTANTS 38260	"	N/A	"	"	"	"	"	"	"	"	"
ALGICIDES* 74051	"	"	"	"	"	"	"	"	"	"	"
CHLORINATED HYDRO-CARBONS* (EXCEPT PESTICIDES) 74052	"	"	"	"	"	"	"	"	"	"	"
PESTICIDES* 74053	"	"	"	"	"	"	"	"	"	"	"

*Name specific compound(s) and fill in the required data for each. Use extra blanks at the end of the form and the "Remarks" space as necessary.

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PART B

(Office use only)

IL 272 0352

Discharge Point No. 002

B-3. RADIOACTIVE PARAMETERS OF INTAKE WATER AND DISCHARGE (See Table B-3)

	Intake	Discharge					
PARAMETER AND CODE	(1) UNTREATED INTAKE WATER	(2) TREATED INTAKE WATER AVERAGE (DAILY)	(3) MINIMUM (OPERATING YEAR)	(4) MAXIMUM (OPERATING YEAR)	(5) SAMPLE FREQUENCY	(6)	(7) CONTINUOUS MONITORING
ALPHA-TOTAL 01501	N/A	N/A	N/A	X	N/A	N/A	N/A
ALPHA COUNTING ERROR 01502	"	"	"	X	"	"	"
BETA-TOTAL 03501	"	"	"	X	"	"	"
BETA COUNTING ERROR 03502	"	"	"	X	"	"	"
GAMMA-TOTAL 05501	"	"	"	X	"	"	"
GAMMA COUNTING ERROR 05502	"	"	"	X	"	"	"
TRITIUM-TOTAL 07000	"	"	"	X	"	"	"
TRITIUM COUNTING ERROR 07001	"	"	"	X	"	"	"

B-4. REMARKS N/A; Not applicable.
O; If posted in Part B, B-2, Column (10), indicates analysis by atomic absorption spectrophotometric techniques preceded by the chelation-extraction procedure when necessary. If posted in Part B, B-1, Column (6), or Part B, B-2, Column (9), indicates one or more grab samples.

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Commonwealth Edison Company
Station: Waukegan
Il 272 0352

Analysis of Discharge from Ash Settling Facility (Slag Field) Prior to Mixing with Other Streams

Parameter	Concentration, *mg/l
Arsenic	0.0067
Cadmium	<0.01
Chromium (Total)	<0.01
Copper	0.02
Iron	<0.01
Lead	<0.01
Manganese	<0.01
Mercury	0.0002
Nickel	0.10
Selenium	0.002

*Concentration based on one grab sample taken during normal operation

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Chlorine Residual Analysis

Free residual chlorine and chloramine concentrations were determined during the chlorination period using sodium hypochlorite solution (13% by weight) to clean the condenser surfaces. In all the tests two methods were used: the amperometric titration (Standard Methods, 13th Edition, Sec. 114B, page 112) and the orthotolidine method (Standard Methods, 13th Edition, Sec. 114C, page 117). The instruments used were the "Wallace and Tiernan Titrator" (Serial No. A790011 LL18160 and A790012 NN30269) for the amperometric titration and the "Wallace and Tiernan Comparator" for the ortholotidine method. A graph of the results by the Orthotolindine Method is attached.

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We have found that the "Amperometric Titration" (Standard Methods, 13th Edition, Sec. 114B, Page 112) gives erratic results in the residual chlorine concentrations for many of our cooling waters. Others in the company also have made this observation in the past. The 13th Edition of Standard Methods (page 113) notes "Interference (with the amperometric titration) has also been noted in some highly colored waters, but the interfering substance has not been established." In our opinion, the results by the "Orthotolidine Method" using the "Wallace and Tiernan Comparator" are more reliable than the results by the "Amperometric Titration" method for our situation.

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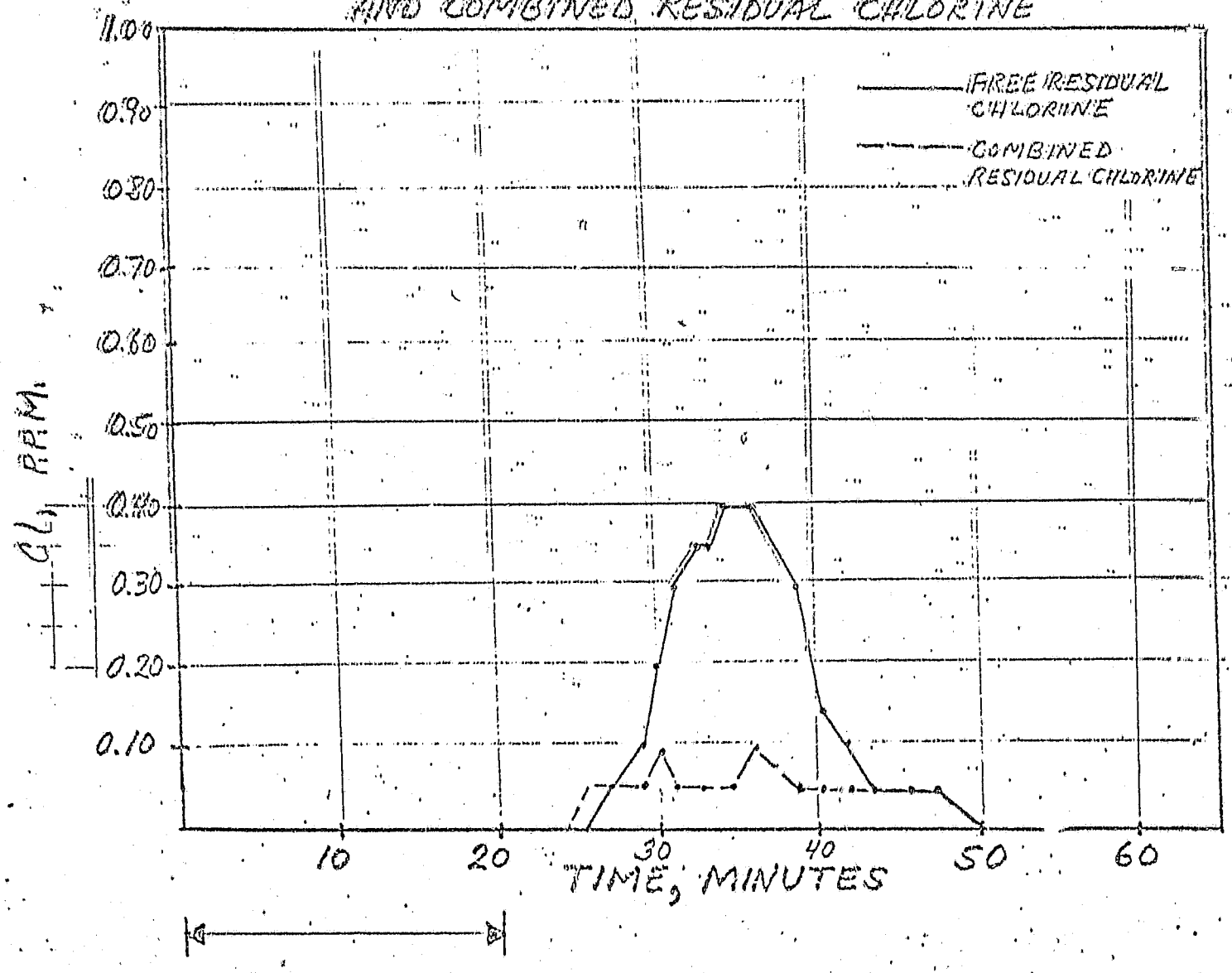
WAUKEGAN STATION 4,5,6,7
IL 272 0352

CONCENTRATIONS OF FREE RESIDUAL AND COMBINED RESIDUAL CHLORINE



CHLORINATION PERIOD, 20 MINUTES

(Revised 7-25-72)

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WAUKEGAN

Re: Section 13 Refuse Act Permit Application, Waukegan Station Il 070 0X3 2 720352

We have rectified the flow data reported in Items #13 and #14, Section I, and in Items #22, Section II. (See page 2, form 4345, revised date 7-25-72, page 2, form 4345-1 revised date 7-25-72.

The settling facilities at Waukegan Station, (Settling Pond and Dewatering Bins) have the following volumes:

Settling Pond	13 acre-ft.
Dewatering Bins	10,000 cu. ft.

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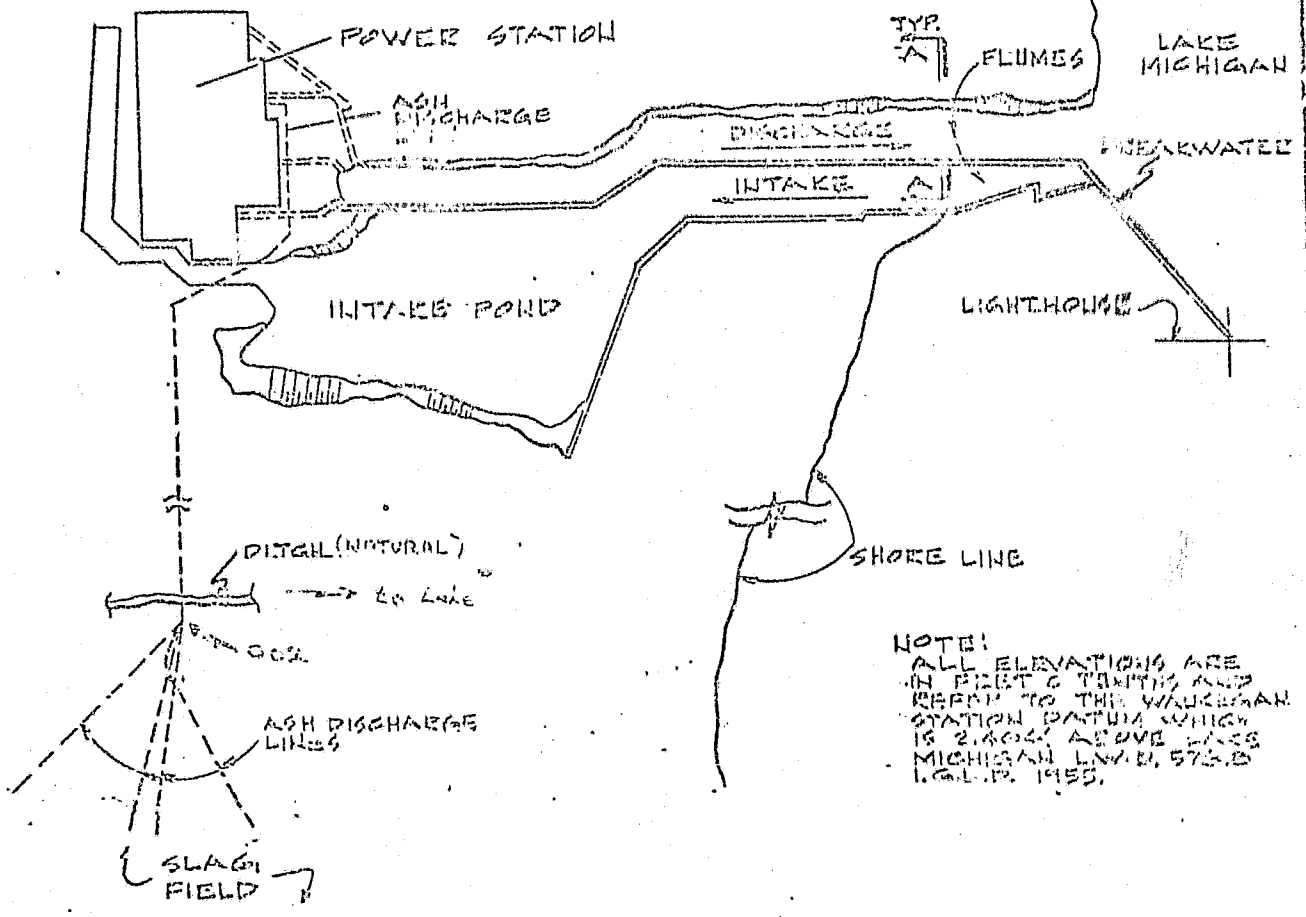
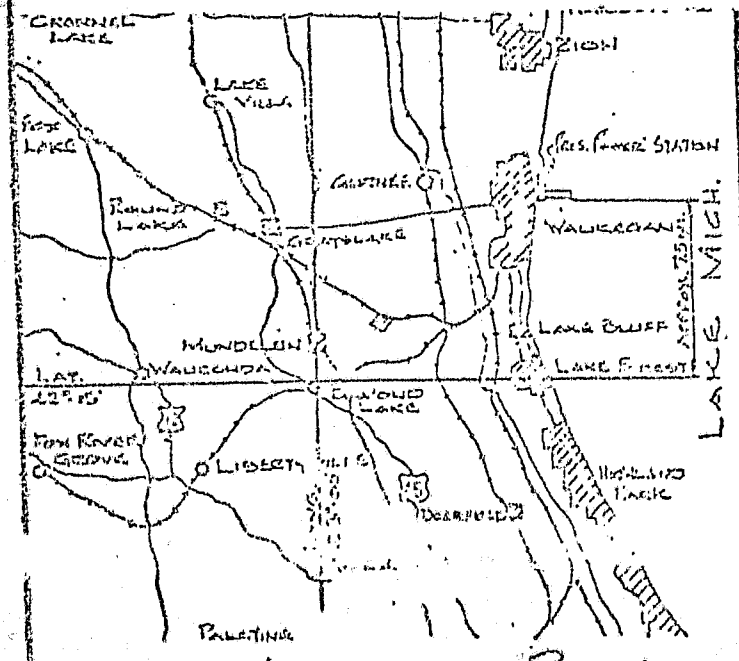
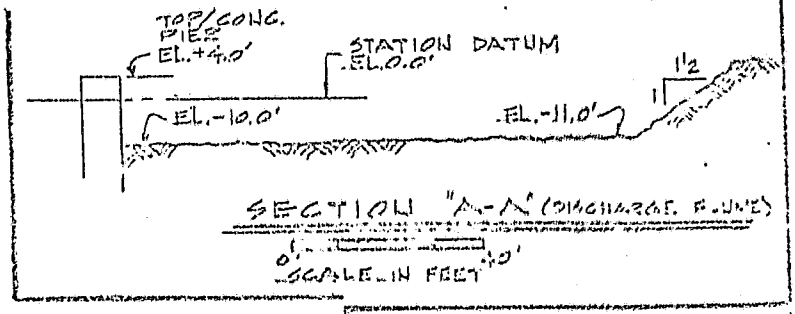


NOTE:
ALL ELEVATIONS ARE IN FEET & TENTHS AND REFER TO THE WAUKEGAN STATION DATUM WHICH IS 2.404' ABOVE LAKE MICHIGAN L.W.D. 576.6 I.G.L.D. 1955.

SITUATION PLAN
0' 500'
SCALE IN FEET



LOCATION PLAN



SECTION "A-A" (DISCHARGE FLUME)
0' 10'
SCALE IN FEET

COPIED FROM MILWAUKEE SECTIONAL AERONAUTICAL CHART BY U.S. COAST & GEODETIC SURVEY. BASIC EDITION NOV. 1957 REVISED APR. 1961

WAUKEGAN STATION NO. 1G

PROPOSED DISCHARGE IN LAKE MICHIGAN @ WAUKEGAN STATION COUNTY OF LAKE, STATE, ILL. APPLICATION BY COMMONWEALTH EDISON CO

DRAWN	
CHECKED	
ENGINEER	
APPROVED	
REVISED	5577 1 OF 1

Rec'd IEPA
9-19-72

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JUN 4 1974

PERMIT SECTION
ENVIRONMENTAL PROTECTION AGENCY
STATE OF ILLINOIS

SPECIAL CONDITIONS FOR

COMMONWEALTH EDISON COMPANY
Waukegan, Illinois
Permit Application No. IL 070 0X3 2 72035?
IL 0002259

JUSTIFICATION

Introduction

This facility is a fossil fuel fired electric power generating station discharging to Lake Michigan. It began operating in 1924 and has a rated capacity of 1047 MW.

There are two discharges. Discharge 001 has a flow of 907 MGD and is composed mainly of condenser cooling water with house service water, boiler blowdown, demineralizer regenerative waste, and demineralizer filter backwash comprising the rest. Discharge 002 has a flow of 6.85 MGD and is the ash pond effluent.

Recent changes in the discharge structure should result in compliance with Illinois Regulations for thermal discharge. However, chlorination is a serious problem as is intake structure. The Waukegan station chlorinates to 0.4 mg/l which is ten times as high as the recommended limit for Lake Michigan waters. Also the Waukegan intake structure has been known to impinge thousands of fish per day. The intake is located on the shore and there are provisions for de-icing.

Part I, A

Several of the plants' waste streams are diluted by the condenser cooling water before discharge . These will have to be sampled before dilution to determine compliance with permit conditions.

The effluent limitations are based on Illinois Water Pollution Regulations and regional policy. Thermal restrictions are based on Illinois regulations for Lake Michigan. The chlorine residual restrictions are based on the recommendations of the U. S. EPA Water Quality Laboratory in Duluth, Minnesota. These limits are necessary to protect the salmonid species of fish that are known to be present in the area of the Waukegan station

Part III

This wording has been developed by Region V to ensure that all intake structures, existing or proposed will be evaluated by the company with regard to 316 (b) of the Act.

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Permit No. IL 0002259

Application No. IL 070 0X3 2 720352

AUTHORIZATION TO DISCHARGE UNDER THE

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM

In compliance with the provisions of the Federal Water Pollution Control Act, as amended, (33 U.S.C. 1251 et seq ; the "Act"),

COMMONWEALTH EDISON COMPANY, WAUKEGAN STATION

is authorized to discharge from a facility located at Waukegan, Illinois

to receiving waters named Lake Michigan

in accordance with effluent limitations, monitoring requirements and other conditions set forth in Parts I, II, and III hereof.

This permit shall become effective on the date of issuing authority's signature.

This permit and the authorization to discharge shall expire at midnight, October 1, 1978 . Permittee shall not discharge after the above date of expiration. In order to receive authorization to discharge beyond the above date of expiration, the permittee shall submit such information, forms, and fees as are required by the Agency authorized to issue NPDES permits no later than 180 days prior to the above date of expiration.

Signed this

Director, Enforcement Division

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PART I

A. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

1. During the period beginning with the effective date of this permit and lasting until the expiration date, the permittee is authorized to discharge from outfall(s) serial number(s) 001-A,B,C,D,E, & Composite & 002

Such discharges shall be limited and monitored by the permittee as specified below:

EFFLUENT CHARACTERISTIC	DISCHARGE LIMITATIONS kg/day (lbs/day)		Other Units (Specify)		MONITORING REQUIREMENTS Measurement Frequency	Sample Type
	Daily Avg	Daily Max	Daily Avg	Daily Max		
Flow-M^3/Day (MGD)	-	-	-	-	Continuous	-
Suspended Solids	-	-	-	15 mg/l	Weekly	24 hour composite
Oil & Grease	-	-	10 mg/l	15 mg/l	Weekly	Grab
002 Only						
Total Iron	-	-	-	2.0 mg/l	Weekly	24 hour composite
Dissolved Iron	-	-	-	0.5 mg/l	Weekly	24 hour composite
Total Nickel	-	-	-	1.0 mg/l	Weekly	24 hour composite

These 001 effluent streams are defined as follows: A - Condenser Cooling Water
B - Boiler Blowdown
C - Demineralizer Regenerant Wastes
D - Demineralizer Filter Backwash
E - Plant House Service Water
Composite - Total Discharge

2. The pH shall not be less than 6.0 nor greater than 9.0 and shall be monitored continuously for 001-composite and 002 weekly for 001-A,B,C,D,E, - Grab Samples.

3. There shall be no discharge of floating solids or visible foam in other than trace amounts.

4. Samples taken in compliance with the monitoring requirements specified above shall be taken at the following location(s): 001-A,B,C,D,E at a point before mixing with any other streams. 001-composite & 002 at a point as close as possible to the outfall to Lake Michigan.

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A. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS (Cont.)

5. Compliance with the numerical effluent standards is not required when effluent concentrations in excess of the standards result entirely from influent contamination, evaporation, and/or the incidental addition of traces of materials not utilized or produced in the activity that is the source of the waste.

6. During the period beginning with the effective date and lasting until the expiration date, the permittee is authorized to discharge from outfall 001-composite a heated effluent which shall at no time raise the natural temperature of Lake Michigan more than 3°F at the edge of a mixing zone, which shall be no greater than a circle with a radius of 1000 feet or an equal fixed area of simple form. In addition, the water temperature outside the mixing zone shall not exceed the maximum limits (°F) indicated in the following table:

JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC
45	45	45	55	60	70	80	80	80	65	60	50

In addition, the permittee shall perform the following thermal monitoring:

a. The permittee shall monitor and record the temperature of the discharge on a continuous basis.

b. The permittee shall determine the Δ 3°F contour of the mixing zone once every three months and report it to the Regional Administrator and the Illinois Environmental Protection Agency.

c. Within ninety (90) days of the date of this permit, the permittee shall submit to the Regional Administrator for approval the designs for the investigation of the effects of the heated effluent on the ecology of the receiving waters. Within six (6) months of the approval of these designs, the permittee shall have initiated the investigation and beginning after one year of approval, the permittee shall submit annual status reports. In addition, as a part of the application for renewal of this permit, a summary status report of this study shall be submitted.

All data and records associated with this study shall be retained in their entirety by the permittee and shall be made available subject to the request of the Regional Administrator and/or the Illinois Environmental Protection Agency.

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Permit No. IL 0002259

PART I

A. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

1. During the period beginning with the effective date and lasting until June 30, 1974, the permittee is authorized to discharge from outfall(s) serial number(s) 001-Composite

Such discharges shall be limited and monitored by the permittee as specified below:

EFFLUENT CHARACTERISTIC	DISCHARGE LIMITATIONS kg/day (lbs/day) Daily Avg	kg/day (lbs/day) Daily Max	Other Units (Specify) Daily Avg	Other Units (Specify) Daily Max	MONITORING REQUIREMENTS Measurement Frequency	Sample Type
Total Chlorine Residual	-	-	-	0.4 mg/l	Once per week	Grab

2. Samples taken in compliance with the monitoring requirements specified above shall be taken at the following location(s): At a point at close as possible to the outfall to Lake Michigan.

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Permit No. IL 0002259

PART I

A. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

1. During the period beginning July 1, 1974 and lasting until the expiration date, the permittee is authorized to discharge from outfall(s) serial number(s) 001-composite

Such discharges shall be limited and monitored by the permittee as specified below:

EFFLUENT CHARACTERISTIC	DISCHARGE LIMITATIONS				MONITORING REQUIREMENTS	
	kg/day (lbs/day)		Other Units (Specify)		Measurement Frequency	Sample Type
	Daily Avg	Daily Max	Daily Avg	Daily Max		
Total Chlorine Residual	-	-	-	*0.04 mg/l	Once per application	Grab

*Only for chlorination periods of 2 hours or less per day. For periods of longer duration, the limit shall be 0.002 mg/l.

2. Samples taken in compliance with the monitoring requirements specified above shall be taken at the following location(s): At a point as close as possible to the outfall to Lake Michigan.

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C. SCHEDULE OF COMPLIANCE

1. The permittee shall achieve compliance with the effluent limitations specified for discharges in accordance with the following schedule:

Attainment of operational level by - July 1, 1974

2. No later than 14 calendar days following a date identified in the above schedule of compliance, the permittee shall submit either a report of progress or, in the case of specific actions being required by identified dates, a written notice of compliance or noncomplicance. In the latter case, the notice shall include the cause of non-compliance, any remedial actions taken, and the probability of meeting the next scheduled requirements.

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PART III

OTHER REQUIREMENTS

Within one year of the effective date of this permit[1] the permittee shall submit a report to the Regional Administrator providing plans for the construction of cooling water intakes that reflect the best technology available as required by Section 316 of the act. The report shall contain a detailed demonstration that the proposed structures minimize environmental impact and a summary of monitoring data collected to determine the effects of the present intake on the various species and life stages of fish. Such monitoring data shall also be submitted regularly with other monitoring reports.

In circumstances where the permittee represents his existing system or some minor modification of it as best available technology, the monitoring program shall include at a minimum a tabulation of all fish trapped by the present intake structure. This tabulation shall be performed every fourth day[2] beginning within (30) days after the effective date of this permit and shall include the number, weight and species of each fish entrapped.

The report shall be evaluated with regard to 316(b) of the Act. As a result of this evaluation, the Regional Administrator shall establish an implementation schedule for compliance with Section 316(b).

[1](or shorter period of it is determined by the permit division that intake monitoring data already exists or a problem is evident.)

[2](periodically for smaller discharges.)

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OCT 23 1973
DIV. OF WATER POLLUTION CONTROL
ENVIRONMENTAL PROTECTION AGENCY

SECTION 401 CERTIFICATION

REVIEW BY ENFORCEMENT SERVICES SECTION

Applicant: Commonwealth Edison - Waukegan IL 070 OX3 2 720352

Location: Waukegan

	No	Yes (date)	Attached
Board Order	X		
Pending Variance or Enforcement		X	
Referral	X		

Comments on proposed permit:

(1) Complaint forwarded to A-G. (Permit)

(2) No effluent limits noted

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PERMIT SECTION
ENVIRONMENTAL PROTECTION AGENCY
STATE OF ILLINOIS

By LH 10/23/73

Date October 22, 1973

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STATE OF ILLINOIS
ENVIRONMENTAL PROTECTION AGENCY

IPDES 73-72

INTER-OFFICE CORRESPONDENCE

Name of Person Completing Form: Rick Squiniger

DATE: 10/30/73

Date Completed: 12-19-73

MEMO TO: Surveillance Section, DWPC

FROM: James B. Park, Permit Section, DWPC

SUBJECT: Commonwealth Edison Company Federal Permit Review
Waukegan Generating Station
Waukegan, Lake County

This Agency has been notified that the federal Environmental Protection Agency intends to permit the subject project pursuant to Section 402 of the Federal Water Pollution Control Act Amendments of 1972. Section 401 of the same Act requires State certification as part of the permitting procedure. The Act also requires public notice to solicit comment and the holding of public hearing if deemed necessary. This Agency's proposed position is to be set forth in the public notice. The purpose of this inquiry memorandum is to gather the outlined information necessary to determine this Agency's position.

Please furnish the following information on the subject project. There are a total of 2 discharges indicated in the federal permit application. A map is furnished showing the designation for each discharge and its location. Please reference each comment with the designation of the discharge being commented on.

1) Does the attached map accurately show the location and number of discharges from this facility? Yes [X] No [ ]

If no, describe discrepancies. We made a couple minor changes to letter show the piping arrangement at the plant site.

2) Are there any present violations of effluent or water quality standards?

Yes [ ] No [X] None substantiated

If yes, describe violation. Could be possible violations of water quality standards (Rule 203); specifically with respect to ammonia, phosphorus, sulfate, and thermal standards; extensive water quality sampling would be necessary to show any violations though;

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STATE OF ILLINOIS
PERMIT SECTION

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STATE OF ILLINOIS
Lake Michigan Surveillance Unit
NOV 2 1973

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SURVEILLANCE SECTION
DEC 27 1973

EVERY INTER-OFFICE LETTER SHOULD HAVE ONLY ONE SUBJECT.
ALL LETTERS TO BE SIGNED. NO SALUTATION OR COMPLIMENTARY CLOSING NECESSARY.

EPA-90-7/71

Environmental Protection Agency
State of Illinois

ENVIRONMENTAL PROTECTION AGENCY

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FEDERAL PERMIT REVIEW

3) Does the facility have the demonstrated capability of producing an effluent that will meet present Illinois effluent and water quality standards?
Yes [X] No [ ] See #2

4). Is the facility as it is presently operated able to meet all future effluent limitations outlined in Illinois Pollution Control Board Regulations?
Yes [X] No [ ] "Questionable"

① From the grab sample collected on 11-27-73 there appears to be no violations

② But data from the applicant's original full EPA permit application indicates a possible Rule 402 (suspended solids) problem at outfall #2.

5) Please provide the date of the latest engineering report, results of latest sample taken and last three monthly operation reports. Also provide data of last Engineering field visit and covering memorandum on it if later than the last engineering report. No engineering report for the facility; Last two field visits with sampling are attached; last three months operating reports are attached; (See our file)

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FEDERAL PERMIT REVIEW

6) Is a referral planned or have any referrals been forwarded to the Enforcement Services Section for action? Yes ☐ No ☒
If yes, provide outline of case and referral number.

7) Please furnish any information on public objection to the subject discharge.
NONE KNOWN

8) Does the Surveillance Section have any additional comments to make pursuant to this Agency's certification action on the discharge(s) to the federal Environmental Protection Agency?
Comm. Ed has not received ILL. EPA permits for these discharges.

Please return this form to J. B. Park, DWPC Permit, Springfield within one week of receipt.

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(312) 793-5632

August 6, 1974

COMMONWEALTH EDISON COMPANY — Waukegan Station
NPDES Certification
USEPA Application #IL-070-0X3-2-720352
Illinois log #NPDES 73-72
CERTIFICATION

A. M. Manzardo
U. S. Environmental Protection Agency
Region V
1 North Wacker Drive
Chicago, Illinois 60606

Gentlemen:

This letter will provide certification to the United States Environmental Protection Agency that there is reasonable assurance that your discharge will comply with the presently effective applicable provisions of sections 301, 302, 306, and 307 of the Federal Water Pollution Control Act Amendments of 1972.

This certification is based on information submitted by you, other information available to this Agency, and the draft permit prepared by the U. S. Environmental Protection Agency. Nothing in this certification shall be construed to waive any liability preserved by Section 510 of the Federal Water Pollution Control Act nor to preclude the institution of any legal action or relieve you from any standards, duties, or liabilities established pursuant to any applicable Illinois laws or regulations or any Illinois permit or regulatory action.

This certification incorporates all applicable provisions of the Illinois Environmental Protection Act and of the Rules and Regulations of the Illinois Pollution Control Board, as if they were fully set forth herein. All such provisions shall become conditions of any federal NPDES permit granted to you pursuant to the subject USEPA application number, as provided by Section 401(d) of the Federal Water Pollution Control Act Amendments of 1972.

This Agency does suggest the following changes in the proposed NPDES permit for the subject discharge:

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COMMONWEALTH EDISON COMPANY - Waukegan Station
NPDES Certification
USEPA Application #IL-070-0X[illegible]362
Illinois Log #NPDES 73-72
CERTIFICATION

1. Discharge limitations and monitoring requirements for Discharge #002 should include the following additional parameters:

Suspended Solids	15 mg/l maximum	24 hour composite - monthly
Total Dissolved Solids	4000 mg/l daily avg.	24 hour composite weekly

2. (a) Demineralizer Regenerative Wastes - Interim to December 31, 1977 #002-C

Total Dissolved Solids	5,540 mg/l daily max.	24 hour composite when discharging weekly

(b) Demineralizer Regenerative Wastes - Final from January 1, 1978 to expiration

	3500 mg/l daily max.	24 hour composite when discharging weekly

Schedule of Compliance

1. Preliminary Report	-	July 1975
2. Preparation Plans & [illegible]lications	-	December 1975
3. Start of Construction	-	April, 1976
4. Start of Full Operation	-	January, 1978

3. Discharge #002 is tributary to an unnamed ditch and thence to Lake Michigan.

Our certification action is contingent upon the above modification of the proposed NPDES permit.

If you have any questions about this certification letter or about the certification procedure, please call James B. Park at the phone number mentioned above.

Very truly yours,

DIVISION OF WATER POLLUTION CONTROL

William H. Busch by
Gary D. Hansen

William H. Busch
Manager
Permit Section

SPG:ah
cc - DWPC, Permit Section-Chgo./Spfld.
- USEPA, Regio V, Permit Branch
- DWPC, Enforcement Section
- Field Operations - Region II

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Permit No.: IL 0002127

#13-1 Chg Lake Co Application No.: IL 070 0X3 2 72052

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) PERMIT PROGRAM
(Section 402, Federal Water Pollution Control Act, As Amended)

10/21/74 WHD CTB L. USEPA

JOINT PUBLIC NOTICE

PROPOSED NPDES PERMIT TO DISCHARGE INTO NAVIGABLE WATERS

U. S. Environmental Protection Agency
Region V, Permit Branch
1 North Wacker Drive
Chicago, Illinois 60606
312-353-1346

Illinois Environmental Protection Agency
2200 Churchill Road
Springfield, Illinois 62706
217-525-6171

Joint Public Notice No.: 41I-0447

RECEIVED
OCT 2 1974
ENVIRONMENTAL PROTECTION AGENCY
DIV. OF WATER POLLUTION CONTROL
PERMIT SECTION - SPRINGFIELD
STATE OF ILLINOIS

Joint Public Notice Issued on:
October 2, 1974

Name and Address of Applicant:
Commonwealth Edison Company
Box 767
Chicago, Illinois 60690

Name and Address of Facility where Discharge Occurs:
Commonwealth Edison Company
Waukegan Station
Greenwood and Lake Michigan
Waukegan, Illinois 60085

Receiving Water: Lake Michigan
Classification: General Use

The above named applicant has applied for an NPDES Permit to discharge into the designated receiving water and requested State Certification of said discharge. The permit will be issued by either the U. S. Environmental Protection Agency or other NPDES issuing authority for a term of not more than 5 years.

Applicant operates a fossil-fuel fired steam electric generating plant with a net generating capacity of 933 megawatts at the above location. The application is for two existing discharges 001 & 002. Discharge 001 consists of condenser cooling water, house service water and boiler blowdown at a rate of 3.44 billion liters (907 million gallons) per day. Discharge 002 is the ash pond overflow which discharges at a rate of 26 million liters (6.9 million gallons) per day. Parameters to be limited in the tentative determination include suspended solids, oil & grease, total chlorine residual, total dissolved solids, temperature, pH, iron and nickel. The tentative determination requires compliance with Illinois Pollution Control board Rules and Regulations and United States Environmental Protection Agency proposed guidelines for the Steam Electric Power Generating Industry. The applicant has attempted to demonstrate under Section 316(a) of the Federal Water Pollution Control Act Amendments of 1972 that thermal discharge limitations based on Illinois Water Pollution Regulations are more stringent than necessary to assure the protection and propagation of a balanced, indigenous population of shellfish, fish and wildlife in and on the receiving body of water.

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Date: OCT 2 1974

Permit No. IL 0002259

U.S. EPA has several reservations about the demonstration as it presently exists. These reservations are delineated in the Fact Sheet. Therefore, the applicant is allowed one year to address these deficiencies. A schedule of compliance is included in the tentative determination, in the event the applicant is unable to successfully address the noted deficiencies. Thermal discharge limitations based on Illinois Water Pollution Regulations and the proposed guidelines will be used if the applicant is unsuccessful.

N-878

Electronic Filing: Received, Clerk's Office 10/31/2022

Permit No.: IL 0002259

Application No.:
IL 070 0X3 2 720352

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) PERMIT PROGRAM
(Section 402, Federal Water Pollution Control Act, as amended)

FACT SHEET

PROPOSED NPDES PERMIT TO DISCHARGE INTO NAVIGABLE WATERS

U. S. Environmental Protection Agency
Region V, Permit Branch
1 North Wacker Drive
Chicago, Illinois 60606
312-353-1346

Illinois Environmental Protection Agency
2200 Churchill Road
Springfield, Illinois 62706
217-525-6171

Joint Public Notice No.: 41I-0447

Joint Public Notice Issued on:

October 2, 1974

Name and Address of Applicant:

Commonwealth Edison Company
Box 767
Chicago, Illinois 60690

Name and Address of Facility where Discharge Occurs:

Commonwealth Edison Company
Waukegan Station
Greenwood and Lake Michigan
Waukegan, Illinois 60085

Receiving Water: Lake Michigan
Classification Code: General Use

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ENVIRONMENTAL PROTECTION AGENCY
DIV. OF WATER POLLUTION CONTROL
PERMIT SECTION - SPRINGFIELD
STATE OF ILLINOIS

I. LOCATION OF DISCHARGE

The above named applicant has applied for an NPDES permit, which will be issued by the U. S. Environmental Protection Agency or other NPDES issuing authority, to discharge into the designated receiving water. A description and/or sketch of the location of the discharge is appended as Attachment I.

II. DESCRIPTION OF EXISTING DISCHARGE

A quantitative description of the existing discharge in terms of significant effluent parameters is appended as Attachment II.

7-878

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Permit No.: IL 0002259

III. Tentative Determinations

A. The U. S. Environmental Protection Agency has examined the application and has made the tentative determination to issue the permit subject to certain effluent limitations and other mandatory conditions and subject to State certification.

B. The effluent limitations in the proposed permit are appended as Attachment IIIa.

C. The schedule of compliance for meeting the proposed effluent limitations is appended as Attachment IIIb.

D. The other special conditions in the proposed permit may include, but are not necessarily limited to: monitoring, recording, and reporting discharges; limiting discharges of oil, hazardous substances, collected solids, visible floating solids, foams, and effluent batch discharges; planning for electric power failure and spill prevention and containment; and prohibiting bypass of treatment facilities. Persons wishing further information about the special conditions may contact the U. S. Environmental Protection Agency.

IV. Procedures for the Formulation of Final Determinations

A. Interested persons are invited to submit written comments upon the proposed discharge. Comments should be submitted in person or by mail no later than 30 days after the joint public notice of this application is issued. Deliver or mail all comments to:

Mrs. Carolyn Cates
Region V, Permit Branch
U. S. Environmental Protection Agency
1 North Wacker Drive
Chicago, Illinois 60606

The application and joint public notice numbers should appear next to the above address on the envelope and on each page of any submitted comments. All comments received no later than 30 days after the joint public notice is issued will be considered in the formulation of final determinations. The U. S. Environmental Protection Agency or other NPDES authority will issue final determinations in a timely manner after the expiration of the public comment period.

7-828-2

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B. If written comments indicate a significant public interest in the application, the Regional Administrator shall hold a public hearing on the application. If held, the public hearing will be designed to collect relevant information pertaining to the application in an orderly and expeditious manner. Public notice of a public hearing will be circulated at least 30 days in advance of such event. The public hearing will be held within the State where the discharge occurs. After the public hearing, the Regional Administrator will formulate his final determination. Further information regarding the conduct and nature of the public hearings concerning discharge permits may be obtained by contacting the U. S. Environmental Protection Agency.

Any person who wishes an adjudicatory hearing must submit, within 10 days of receipt of the issued permit, a request for an adjudicatory hearing to consider the issued permit and its conditions. If the request is granted, any person may submit a request to be a party to such a hearing within 30 days after issuance of the public notice of the hearing. All requests for adjudicatory hearings that meet the requirements of 40 CFR 125.36 (c)(1)(i) and (ii), published at 39 Federal Register 27081 (July 24, 1974) shall be granted. Adjudicatory hearings will be held pursuant to 40 CFR 125.36. Adjudicatory hearings will consider specific contested issues of fact relating to the permit and will be conducted in conformance with procedures established in the Administrative Procedure Act (5 U.S.C. § 551 et seq.). Questions of law will be referred for decision to the Assistnat Administrator for Enforcement and General Counsel, pursuant to 40 CFR § 125.36 (m), published at 39 FR 27083.

Requests for a public hearing should: state the name and address of the person requesting the hearing and of any person represented at the hearing by the requester; identify the interest in the proposed permit of the requester and of any person represented by him; state the reasons for the request; state the issues proposed to be considered at the hearing; and state the position of the requester on the issues to be considered at the hearing. Requests for an adjudicatory hearing shall meet all the above specified procedures for requesting a public hearing and also shall include an agreement by the requester to subject himself, or if a corporation to subject its employees, to examination and cross-examination upon the request of the presiding officer.

Requests for adjudicatory hearings shall also include proposed terms and conditions which, in the judgment of the requester, would be required to carry out the intendment of the Act.

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The Regional Administrator may hold a hearing if a modification to the proposed thermal limitations is requested pursuant to Section 316(a) of the Act. Any hearing held to consider the imposition of alternative effluent limitations on the thermal component of the discharges authorized by Section 316(a) shall be conducted in accordance with 40 CFR 122. Any request to be a party shall be filed in accordance with the procedures specified in 40 CFR 125.36(d)..

C. Persons wishing further information may contact the U. S. Environmental Protection Agency. Copies of the application, proposed permit including proposed effluent limitations, special conditions, comments received, and other documents are available for inspection and may be copied at a cost of 20 cents per page.

V. USE CLASSIFICATION, WATER QUALITY STANDARDS, AND EFFLUENT LIMITATIONS

The receiving water is classified for general use.

The following water quality standards and effluent standards and limitations were applied to the discharge:

The proposed Steam Electric Power Plant Guidelines and Illinois Water Pollution Regulations.

F. 878-4

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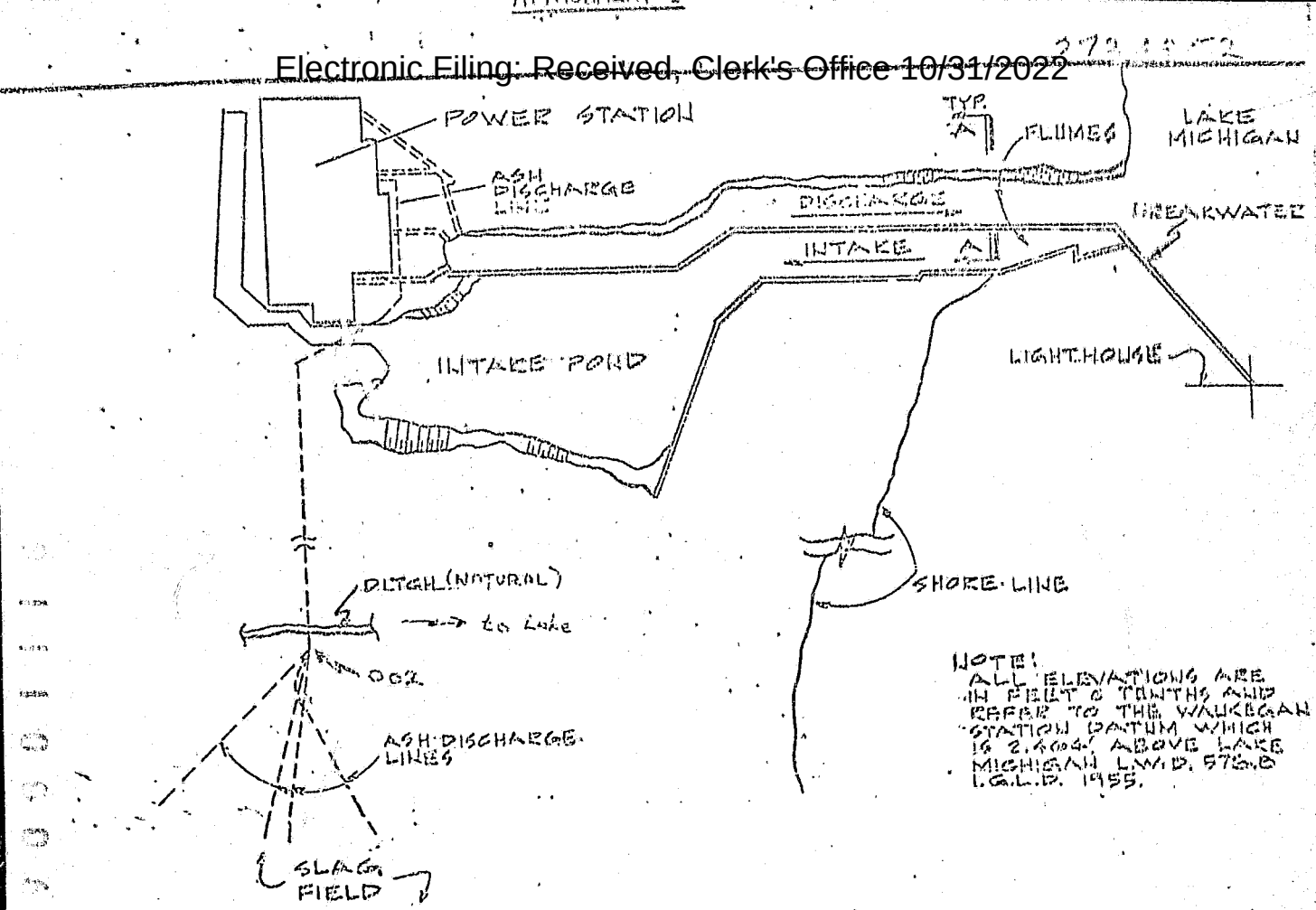
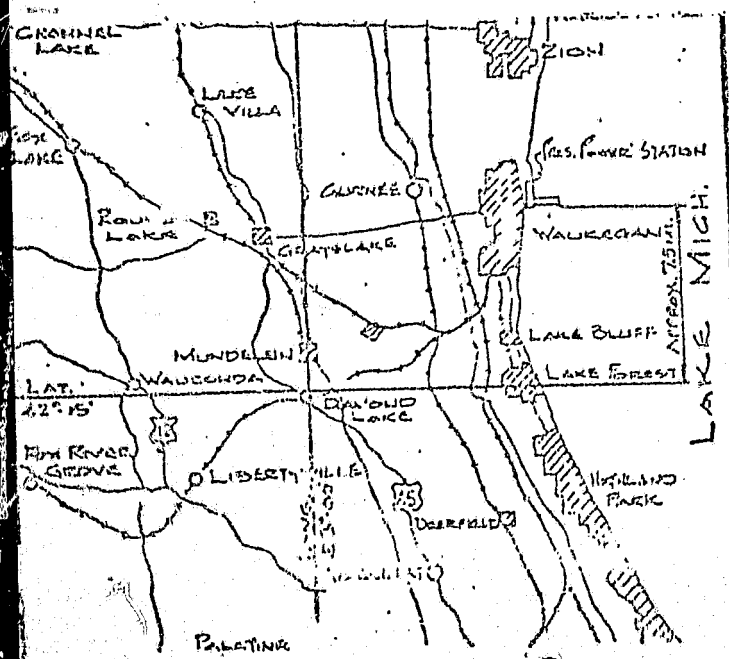
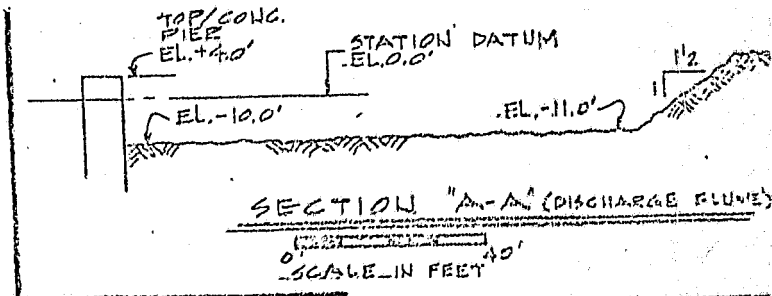


SITUATION PLAN

0' 500'
SCALE IN FEET



LOCATION PLAN



SECTION "A-A" (DISCHARGE FLUME)

0' 40'
SCALE IN FEET

COPIED FROM MILWAUKEE SECTIONAL AERONAUTICAL CHART BY U.S. COAST & GEODETIC SURVEY.
BASE EDITION NOV. 1957
REVISED: APR. 1961

WAUKEGAN STATION NO. 2

PROPOSED DISCHARGE IN LAKE MICHIGAN @ WAUKEGAN STATION COUNTY OF LAKE, STATE, ILL.
APPLICATION BY COMMONWEALTH EDISON C

DRAWN	SORENSEN	DESIGNED
CHECKED	GF	
ENGINEER		
APPROVED		JOB NO.
REVISED		3377

7-878-5

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ATTACHMENT II

Description of Existing Discharge

Discharge 001 - Condenser cooling water, boiler blowdown and plant house service water.

Parameter		Value	
Average Flow	-	3.44 billion liters (907 million gallons) per day.	
Average Temperature	-	Intake	Discharge
Winter °C(°F)		3.9(39)	8.3(47)
Summer °C(°F)		16.7(62)	22.8(73)
Total Chlorine Residual	-	0.5 mg/l	

Discharge 002 - Ash pond overflow

Parameter		Value
Average Flow	-	26 million liters (6.9 million gallons) per day.
pH range	-	7.5-7.9
Suspended Solids	-	30 mg/l
Oil & Grease	-	Not Reported
Total Iron	-	1.0 mg/l
Total Nickel	-	0.1 mg/l
Dissolved Solids	-	408 mg/l

Discharge 002 - Demineralizer Regenerant Wastes

Parameter		Value
Average Flow	-	174,000 liters (46,100 gallons) per day
Total Dissolved Solids	-	8540 mg/l

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ATTACHMENT IIIa

Proposed Effluent Limitations

Discharge 001

Parameter	Maximum Limits
Total Chlorine Residual	.04 mg/l

Ash Pond Overflow

Parameter	Maximum Limits
Suspended Solids	15 mg/l
Oil & Grease	15 mg/l
Total Iron	2 mg/l
Dissolved Iron	0.5 mg/l
Total Nickel	1 mg/l
Dissolved Solids	408 mg/l
pH 6.0 - 9.0	

Demineralizer Regenerant Wastes

Parameter	Maximum Limits
Total Dissolved Solids	3500 mg/l

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ATTACHMENT IIIa(cont'd.)

Thermal Limitations*

The heated effluent shall at no time raise the natural temperature of Lake Michigan more than 3°F at the edge of the mixing zone.

The water temperature at the edge of the mixing zone, and at other representative locations in the Lake shall not exceed the maximum limits (°F) indicated in the following table:

JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC
45	45	45	55	60	70	80	80	80	65	60	50

The mixing zone shall be no greater than the area of a circle with a radius of 1000 ft.

* This limitations applies only to discharge 001. It will not take effect if the applicant makes a successful 316(a) demonstration by October 1, 1975. At present, the demonstration has the following deficiencies:

1. Lake Current Studies must be submitted and correlated with biological and chemical surveys.

2. The phytoplankton and zooplankton studies results have been influenced by the effluent from the North Shore Sanitary District. This deficiency must be addressed.

3. No sampling stations were located south of the plant.

4. The seasonal distribution and abundance of fish eggs and larvae and the effects of plant operation on these life stages is not adequately documented.

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ATTACHMENT IIIb

Schedule of Compliance

Total Chlorine Residual Reduction

Report of Progress	-	April 1, 1975
Attainment of operational level by	-	October 1, 1975

Dissolved Solids Reduction

Preliminary Report	-	July 1, 1975
Preparation of Plans & Specifications	-	December 1, 1975
Start of Construction	-	April 1, 1976
Report of Progress	-	January 1, 1977
Report of Progress	-	July 1, 1977
Start of Full Operation	-	January 1, 1978

Thermal Reduction

Completion of Preliminary Plans	-	December 31, 1974
Deadline for successful 316(a) demonstration	-	October 1, 1975
Completion of Final Plans	-	December 31, 1975
Commencement of Construction	-	March 31, 1976
Report of Construction Progress	-	September 30, 1976
Completion of Construction	-	March 31, 1977
Attainment of Operational Level	-	July 1, 1977
	-	
	-	

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OCT 2 1974

PROPOSED
SUBJECT TO REVISION.

Permit No. IL 0002259

Application No. IL 070 0X3 2 720352

AUTHORIZATION TO DISCHARGE UNDER THE

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM

In compliance with the provisions of the Federal Water Pollution Control Act, as amended, (33 U.S.C. 1251 et seq; the "Act"),

COMMONWEALTH EDISON COMPANY, WAUKEGAN STATION

is authorized by the United States Environmental Protection Agency, Region V, to discharge from a facility located at Waukegan, Illinois

RECEIVED
OCT 2 1974
ENVIRONMENTAL PROTECTION AGENCY
DIV. OF WATER POLLUTION CONTROL
PERMIT SECTION - SPRINGFIELD
STATE OF ILLINOIS

to receiving waters named Lake Michigan

in accordance with effluent limitations, monitoring requirements and other conditions set forth in Parts I, II, and III hereof.

This permit and the authorization to discharge shall expire at midnight, October 1, 1979 . Permittee shall not discharge after the above date of expiration. In order to receive authorization to discharge beyond the date of expiration, the permittee shall submit such information, forms, and fees as are required by the Agency authorized to issue NPDES permits no later than 180 days prior to the above date of expiration.

This permit shall become effective 30 days from this date of signature.

Signed this

Director, Enforcement Division

P-878-1

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PART I

A. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

1. During the period beginning on the effective date of this permit and lasting until September 30, 1975 the permittee is authorized to discharge from outfall(s) serial number(s) 001

Such discharges shall be limited and monitored by the permittee as specified below:

EFFLUENT CHARACTERISTIC	DISCHARGE LIMITATIONS kg/day (lbs/day) Daily Avg	Daily Max	Other Units (Specify) Daily Avg	Daily Max	MONITORING REQUIREMENTS Measurement Frequency	Sample Type
Flow M^3/Day (MGD) *	-	-	-	-	Continuous	-
Temperature °C(°F) *	-	-	-	-	Continuous	-
Total Chlorine Residual	-	-	-	0.5 mg/l**	Weekly	Grab
Waste Heat Rejection Rate KJ/hr.(BTU/hr.)		-	-	-	Monthly	Maximum
Plant Capacity Factor (%Capacity)		-	-	-	Monthly	Average
Duration of Chlorination period	-	-	-	-	Monthly	Report
Frequency of Chlorination	-	-	-	-	Monthly	Report

There shall be no discharge of floating solids or visible foam in other than trace amounts.

Samples taken in compliance with the monitoring requirements specified above shall be taken at the following location(s): At a point representative of the discharge but prior to entry into Lake Michigan.

*Intake & Discharge

**During the chlorination period not to exceed 2 hours per day.

2-818-8

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PART I

A. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

2. During the period beginning October 1, 1975 and lasting until October , 1979 the permittee is authorized to discharge from outfall(s) serial number(s) 001

Such discharges shall be limited and monitored by the permittee as specified below:

EFFLUENT CHARACTERISTIC	DISCHARGE LIMITATIONS kg/day (lbs/day) Daily Avg	Daily Max	Other Units (Specify) Daily Avg	Daily Max	MONITORING REQUIREMENTS Measurement Frequency	Sample Type
Flow M^3/Day (MGD)	-	-	-	-	Continuous	-
Temperature °C(°F)*	-	-	-	-	Continuous	-
Total Chlorine Residual	-	-	-	.0.04 mg/l**	Daily	Grab
Waste Heat Rejection Rate KJ/hr(BTU/hr)		-	-	-	Monthly	Maximum
Plant Capacity Factor(%Capacity)	-	-	-	-	Monthly	Average
Duration of Chlorination Period	-	-	-	-	Monthly	Report
Frequency of Chlorination	-	-	-	-	Monthly	Report

There shall be no discharge of floating solids or visible foam in other than trace amounts.

Samples taken in compliance with the monitoring requirements specified above shall taken at the following location(s): At a point representative of the discharge but prior entry into Lake Michigan.

*Intake & Discharge

**During chlorination periods not to exceed 2 hours per day. If the plume temperature exceeds 70°F the limit shall be 0.2 mg/l.

E.878-D

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A. EFFLUENT LIMITATIONS AND REQUIREMENTS

3. During the period beginning July 1, 1977 and lasting until October 1, 1979 the permittee is authorized to discharge from outfalls serial number 001.*

Such discharges shall be limited and monitored by the permittee as specified below:

a. i. The heated effluent shall at no time raise the natural temperature of Lake Michigan more than 3°F at the edge of the mixing zone.

ii. The water temperature at the edge of the mixing zone, and at other representative locations in the Lake shall not exceed the maximum limits (°F) indicated in the following table:

JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC
45	45	45	55	60	70	80	80	80	65	60	50

iii. The mixing zone shall be no greater than the area of a circle with a radius of 1000 ft.

* These limitations are not applicable if the permittee's 316(a) demonstration is acceptable.

P-878-L

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Permit No. IL 0002259

A. EFFLUENT LIMITATIONS AND REQUIREMENTS (Cont'd)

3b i. The permittee shall determine the area and shape of the mixing zone once per quarter.

All mixing zone measurements shall be reported once per quarter to the Regional Administrator and the Illinois Environmental Protection Agency.

ii. At the time the additional information for 316(a) is submitted but no later than October 1, 1975, the permittee shall submit to the Regional Administrator for approval, a study plan for the investigation of the effects of the heated effluent on the ecology of the receiving waters. The study plan must address those materials developed by the Lake Michigan Cooling Water Studies Panel in its review of the Lake Michigan Studies. In addition, the study plan must be designed to assess, in cooperation with other utilities, the lake-wide effects of cooling water use with emphasis on the southern end of Lake Michigan. Within six (6) months of the approval of these designs, the permittee shall have initiated the investigation and beginning after one (1) year of approval, the permittee shall submit annual status reports. In addition, as a part of the application for renewal of this permit, a summary status report of this study shall be submitted.

All data and records associated with this study shall be retained in their entirety by the permittee and shall be made available subject to the request of the Regional Administrator and/or the Illinois Environmental Protection Agency.

P-878-5

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PART I

A. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

4. During the period beginning on the effective date of this permit and lasting until October 1, 1978 the permittee is authorized to discharge from outfall(s) serial number(s) 002-ash pond overflow

Such discharges shall be limited and monitored by the permittee as specified below:

EFFLUENT CHARACTERISTIC	DISCHARGE LIMITATIONS kg/day (lbs/day)		DISCHARGE LIMITATIONS Other Units (Specify)		MONITORING REQUIREMENTS Measurement Frequency	MONITORING REQUIREMENTS Sample Type
	Daily Avg	Daily Max	Daily Avg	Daily Max		
Flow M^3/Day (MGD)	-	-	-	-	Measure when sampling	
Dissolved Solids	-	-	408 mg/l	-	Weekly	24-hr.Composite
Suspended Solids	-	-	-	15 mg/l	Weekly	24-hr.Composite
Oil & Grease	-	-	10 mg/l	15 mg/l	Weekly	Grab
Iron(Total)	-	-	-	2.0 mg/l	Monthly	24-hr.Composit
Iron(Dissolved)	-	-	-	0.5 mg/l	Monthly	24-hr.Composit
Nickel(Total)	-	-	-	1.0 mg/l	Monthly	24-hr.Composit

The pH shall not be less than 6.0 nor greater than 9.0 and shall be monitored by weekly grab samples.

There shall be no discharge of floating solids or visible foam in other than trace amounts.

Samples taken in compliance with the monitoring requirements specified above shall be taken at the following location(s): At a point representative of the discharge but prior to entry into the unnamed ditch, tributary to Lake Michigan.

8-18-4

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Permit No. IL 0002259

PART I

A. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

5. During the period beginning on the effective date of this permit and lasting until December 31, 1977 the permittee is authorized to discharge from outfall(s) serial number(s) 002-Demineralizer Regenerant Wastes

Such discharges shall be limited and monitored by the permittee as specified below:

EFFLUENT CHARACTERISTIC	DISCHARGE LIMITATIONS kg/day (lbs/day) Daily Avg	kg/day (lbs/day) Daily Max	Other Units (Specify) Daily Avg	Other Units (Specify) Daily Max	MONITORING REQUIREMENTS Measurement Frequency	Sample Type
Flow M^3/Day (MGD)	-	-	-	-	Measure when sampling	
Total Dissolved Solids	-	-	-	8540 mg/l	Weekly when discharging	24-hour Composite

Samples taken in compliance with the monitoring requirements specified above shall be taken at the following location(s): At a point representative of the discharge but prior to mixing with other waters.

9878.7

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PART I

A. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

6. During the period beginning January 1, 1978 and lasting until October 1, 1979 the permittee is authorized to discharge from outfall(s) serial number(s) 002-Demineralizer Regenerant Wastes

Such discharges shall be limited and monitored by the permittee as specified below:

EFFLUENT CHARACTERISTIC	DISCHARGE LIMITATIONS kg/day (lbs/day) Daily Avg	kg/day (lbs/day) Daily Max	Other Units (Specify) Daily Avg	Other Units (Specify) Daily Max	MONITORING REQUIREMENTS Measurement Frequency	Sample Type
Flow M^3/Day (MGD)	-	-	-	-	Measure when sampling	
Total Dissolved Solids	-	-	-	3500 mg/l	Weekly when discharging	24-hour Composite.

Samples taken in compliance with the monitoring requirements specified above shall be taken at the following location(s): At a point representative of the discharge but prior to mixing with other waters.

P-S 79-8

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B. MONITORING AND REPORTING

1. Representative Sampling

Samples and measurements taken as required herein shall be representative of the volume and nature of the monitored discharge.

2. Reporting

Monitoring results obtained during the previous three months shall be summarized and reported on a Discharge Monitoring Report Form (EPA No. 3320-1), postmarked no later than the 28th day of the month following the completed reporting period. The first report is due on January 28, 1975. Duplicate signed copies of these, and all other reports required herein, shall be submitted to the Regional Administrator and the State at the following addresses:

U. S. Environmental Protection Agency
Region V, Enforcement Division
Attn: Chief Compliance Section
230 South Dearborn Street
Chicago, Illinois 60604

Illinois Environmental Protection Agency
2200 Churchill Road
Springfield, Illinois 62706

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3. Definitions

a. "Daily Average" Discharge

1. Weight Basis - The "daily average" discharge means the total discharge by weight during a calendar month divided by the number of days in the month that the production or commercial facility was operating. Where less than daily sampling is required by this permit, the daily average discharge shall be determined by the summation of the measured daily discharges by weight divided by the number of days during the calendar month when the measurements were made.

2. Concentration Basis - The "daily average" concentration means the arithmetic average (weighted by flow value) of all the daily determinations of concentration made during a calendar month. Daily determinations of concentration made using a composite sample shall be the concentration of the composite sample. When grab samples are used, the daily determination of concentration shall be the arithmetic average (weighted by flow value) of all the samples collected during the calendar day.

b. "Daily Maximum" Discharge

1. Weight Basis - the "daily maximum" discharge means the total discharge by weight during any calendar day.

2. Concentration Basis - the "daily maximum" concentration means the daily determination of concentration for any calendar day.

P. 878

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4. Test Procedures

Test procedures for the analysis of pollutants shall conform to regulations published pursuant to Section 304(g) of the Act, under which such procedures may be required.

5. Recording of Results

For each measurement or sample taken pursuant to the requirements of this permit, the permittee shall record the following information:

a. The exact place, date, and time of sampling;

b. The dates the analyses were performed;

c. The person(s) who performed the analyses;

d. The analytical techniques or methods used; and

e. The results of all required analyses.

6. Additional Monitoring by Permittee

If the permittee monitors any pollutant at the location(s) designated herein more frequently than required by this permit, using approved analytical methods as specified above, the results of such monitoring shall be included in the calculation and reporting of the values required in the Discharge Monitoring Report From (EPA No. 3320-1). Such increased frequency shall also be indicated.

7. Records Retention

All records and information resulting from the monitoring activities required by this permit including all records of analyses performed and calibration and maintenance of instrumentation and recordings from continuous monitoring instrumentation shall be retained for a minimum of three (3) years, or longer if requested by the Regional Administrator or the State water pollution control agency.

P. 878.11

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C. SCHEDULE OF COMPLIANCE

1. The permittee shall achieve compliance with the effluent limitations specified for discharges in accordance with the following schedule:

Total Chlorine Residual Reduction

Report of Progress	- April 1, 1975
Attainment of operational level by	- October 1, 1975

Dissolved Solids Reduction

Preliminary Report	- July 1, 1975
Preparation of Plans & Specifications	- December 1, 1975
Start of Construction	- April 1, 1976
Report of Progress	- January 1, 1977
Report of Progress	- July 1, 1977
Start of Full Operation	- January 1, 1978

Thermal Reduction

Completion of Preliminary Plans	- December 31, 1974
Deadline for successful 316(a) demonstration	- October 1, 1975
Completion of Final Plans	- December 31, 1975
Commencement of Construction	- March 31, 1976
Report of Construction Progress	- September 30, 1976
Completion of Construction	- March 31, 1977
Attainment of Operational Level	- July 1, 1977
	-
	-

2. No later than 14 calendar days following a date identified in the above schedule of compliance, the permittee shall submit either a report of progress or, in the case of specific actions being required by identified dates, a written notice of compliance or noncompliance. In the latter case, the notice shall include the cause of noncompliance, any remedial actions taken, and the probability of meeting the next scheduled requirements.

R018-1

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PART II

A. MANAGEMENT REQUIREMENTS

1. Change in Discharge

All discharges authorized herein shall be consistent with the terms and conditions of this permit. The discharge of any pollutant identified in this permit more frequently than or at a level in excess of that authorized shall constitute a violation of the permit. Any anticipated facility expansions, production increases, or process modifications which will result in new, different, or increased discharges of pollutants must be reported by submission of a new NPDES application or, if such changes will not violate the effluent limitations specified in this permit, by notice to the permit issuing authority of such changes. Following such notice, the permit may be modified to specify and limit any pollutants not previously limited.

2. Noncompliance Notification

If, for any reason, the permittee does not comply with or will be unable to comply with any daily maximum effluent limitation specified in this permit, the permittee shall provide the Regional Administrator and the State with the following information, in writing, within five (5) days of becoming aware of such condition:

a. A description of the discharge and cause of noncompliance; and

b. The period of noncompliance, including exact dates and times; or, if not corrected, the anticipated time the noncompliance is expected to continue, and steps being taken to reduce, eliminate and prevent recurrence of the noncomplying discharge.

3. Facilities Operation

The permittee shall at all times maintain in good working order and operate as efficiently as possible all treatment or control facilities or systems installed or used by the permittee to achieve compliance with the terms and conditions of this permit.

P.878-1

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4. Adverse Impact

The permittee shall take all reasonable steps to minimize any adverse impact to navigable waters resulting from noncompliance with any effluent limitations specified in this permit, including such accelerated or additional monitoring as necessary to determine the nature and impact of the noncomplying disharge.

5. Bypassing

Any diversion from or bypass of facilities necessary to maintain compliance with the terms and conditions of this permit is prohibited, except (i) where unavoidable to prevent loss of life or severe property damage, or (ii) where excessive storm drainage or runoff would damage any facilities necessary for compliance with the effluent limitations and prohibitions of this permit. The permittee shall promptly notify the Regional Administrator and the State in writing of each such diversion or bypass.

6. Removed Substances

Solids, sludges, filter backwash, or other pollutants removed from or resulting from treatment or control of wastewaters shall be disposed of in a manner such as to prevent any pollutant from such materials from entering navigable waters.

7. Power Failures

In order to maintain compliance with the effluent limitations and prohibitions of this permit, the permittee shall either:

a. In accordance with the Schedule of Compliance contained in Part I, provide an alternative power source sufficient to operate the wastewater control facilities;

or, if no date for implementation appears in Part I,

b. Halt, reduce or otherwise control production and/or all discharges upon the reduction, loss, or failure of one or more of the primary sources of power to the wastewater control facilities.

P. 876-15

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B. RESPONSIBILITIES

1. Right of Entry

The permittee shall allow the head of the State water pollution control agency, the Regional Administrator, and/or their authorized representatives, upon the presentation of credentials:

a. To enter upon the permittee's premises where an effluent source is located or in which any records are required to be kept under the terms and conditions of this permit; and

b. At reasonable times to have access to and copy any records required to be kept under the terms and conditions of this permit; to inspect any monitoring equipment or monitoring method required in this permit; and to sample any discharge of pollutants.

2. Transfer of Ownership or Control

In the event of any changes in control or ownership of facilities from which the authorized discharges emanate, the permittee shall notify the succeeding owner or controller of the existence of this permit by letter, a copy of which shall be forwarded to the Regional Administrator and the State water pollution control agency.

3. Availability of Reports

Except for data determined to be confidential under Section 308 of the Act, all reports prepared in accordance with the terms of this permit shall be available for public inspection at the offices of the State water pollution control agency and the Regional Administrator. As required by the Act, effluent data shall not be considered confidential. Knowingly making any false statement on any such report may result in the imposition of criminal penalties as provided for in Section 309 of the Act.

4. Permit Modification

After notice and opportunity for a hearing, this permit may be modified, suspended, or revoked in whole or in part during its term for cause including, but not limited to, the following:

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a. Violation of any terms or conditions of this permit;

b. Obtaining this permit by misrepresentation or failure to disclose fully all relevant facts; or

c. A change in any condition that requires either a temporary or permanent reduction or elimination of the authorized discharge.

5. Toxic Pollutants

Notwithstanding Part II, B-4 above, if a toxic effluent standard or prohibition (including any schedule of compliance specified in such effluent standard or prohibition) is established under Section 307(a) of the Act for a toxic pollutant which is present in the discharge and such standard or prohibition is more stringent than any limitation for such pollutant in this permit, this permit shall be revised or modified in accordance with the toxic effluent standard or prohibition and the permittee so notified.

6. Civil and Criminal Liability

Except as provided in permit conditions on "Bypassing" (Part II, A-5) and "Power Failures" (Part II, A-7), nothing in this permit shall be construed to relieve the permittee from civil or criminal penalties for noncompliance.

7. Oil and Hazardous Substance Liability

Nothing in this permit shall be construed to preclude the institution of any legal action or relieve the permittee from any responsibilities, liabilities, or penalties to which the permittee is or may be subject under Section 311 of the Act.

8. State Laws

Nothing in this permit shall be construed to preclude the institution of any legal action or relieve the permittee from any responsibilities, liabilities, or penalties established pursuant to any applicable State law or regulation under authority preserved by Section 510 of the Act.

P. 878-16

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9. Property Rights

The issuance of this permit does not convey any property rights in either real or personal property, or any exclusive privileges, nor does it authorize any injury to private property or any invasion of personal rights, nor any infringement of Federal, State or local laws or regulations.

10. Severability

The provisions of this permit are severable, and if any provision of this permit, or the application of any provision of this permit to any circumstance, is held invalid, the application of such provision to other circumstances, and the remainder of this permit, shall not be affected thereby.

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PART III

Intake Study Requirements

At the time that the additional information for 316(a) is submitted, but no later than October 1, 1975, the permittee shall submit a final report to the Regional Administrator and to the Illinois Environmental Protection Agency providing proposals for measures to be taken by the permittee to meet the requirements of Section 316(b) of the Act for the best cooling water intake technology available. Development of the report shall be guided by the "Development Document for Best Technology Available for Minimizing Adverse Environmental Impact for Cooling Water Intake Structures", as proposed by the U.S. EPA, and by "Lake Michigan Intake Report on Best Available Technology", by Lake Michigan Cooling Water Intake Technical Committee, August 1973.

This report shall be evaluated with regard to Section 316(b) of the Act. As a result of this evaluation, the Regional Administrator may modify the permit in accordance with Part II B4 to establish an implementation schedule to insure compliance with Section 316(b).

P. 878-18

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PART III

OTHER REQUIREMENTS

Additional Reporting of Monitoring to Illinois Environmental Protection Agency

Monitoring results obtained during the previous three months shall be summarized and reported on a Discharge Monitoring Report Form (EPA No. 3320-1), postmarked no later than the 28th day of the month following the completed reporting period. The first quarterly report is due on January 28, 1975. The signed reports required herein, shall be submitted to the State at the following address:

Environmental Protection Agency
State of Illinois
Division of Water Pollution Control
2200 Churchill Road
Springfield, Illinois 62706

P-878-19

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DEC 4 1974
DIV. OF WATER POLLUTION CONTROL
ENVIRONMENTAL PROTECTION AGENCY

73-72 elg Fu...

Mr. John H. Hughes
Director of Water Quality
Commonwealth Edison Company
72 West Adams Street
P. O. Box 767
Chicago, Illinois 60690

NOV 27 1974

Re: Waukegan Generating Station
IL 070 0X3 2 720352
Joint Public Notice No. 411-0447

Dear Mr. Hughes:

[NOT RELD BY IEPA

We are in receipt of your November 1, 1974 letter of comment concerning the above referenced public notice and proposed permit for your Waukegan Generating Station at Waukegan, Illinois. Our responses to the points you have raised are as follows:

1. As you know, the total residual chlorine limit used in the permit is based on water quality considerations. The limitations based on the Steam Electric Guidelines do not address these considerations. In view of the November 5, 1974 stipulation that was signed by your company concerning similar issues in the Sabrooke Generating Station permit, we will change the determination to reflect the wording in the stipulation where possible.

2. Chlorine monitoring requirements will remain as proposed. The stringency of the limits imposed as well as the sensitivity of cold water fish species in the receiving water dictate that these requirements be used.

3. Your request that alternate thermal limitations be inserted in the determination is best handled by means of permit modification. If the 316(a) demonstration is successful, the permit can be modified to include the appropriate limitations.

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DEC 4 1974
DIV. OF WATER POLLUTION CONTROL
ENVIRONMENTAL PROTECTION AGENCY

4. Your request that the thermal plume monitoring requirement be deleted from the permit is also dependent on the outcome of the 316(a) demonstration. If the demonstration is successful, no mixing zone would be specified in the permit; if such a demonstration is unsuccessful, compliance with mixing zone requirements will have to be established. Therefore, the plume monitoring requirement will remain in the determination and would be revised only by permit modification.

5. The determination will be revised to allow 60 days after the submission of the 316(a) demonstration for submission of an ecological study plan as per your request. In addition, the determination will contain wording that will allow the lake-wide effects portion of the study to be incorporated into the proposal for the Zion Station.

6. The limit for dissolved solids in the ash pond discharge has been changed to 750 mg/l as per your request and the State requirements.

7. Your requests for grab samples for suspended solids, dissolved solids, iron and nickel in the ash pond discharge have not been granted. The composite sample is necessary for compliance purposes since the limits used are based on this type of sample. Also, the iron and nickel parameters may only be deleted by means of a permit modification, as described in Part II of the permit.

8. The average limit of 10 mg/l oil and grease on the ash pond discharge will be deleted as per change in effluent limitations.

9. Page seven of the permit was added at the specific request of the Illinois EPA. A copy of their letter of certification regarding the Waukegan facility is attached.

10. We see no basis for your request that the final compliance date for offstream cooling be July 1, 1981. As you know, the thermal requirements of the guidelines do not apply to the Waukegan Station. In addition, since the plant violates water quality standards, it must be in compliance by July 1, 1977 as per Section 301 of the Act. Therefore, no changes will be made in the final date for compliance in the determination.

11. In view of the fact that the chlorination of intake water affects the results of the fish tabulation study, the beginning of the fish tabulation will be delayed until the new chlorination system is installed but no later than October 1, 1975.

Thank you for your continued cooperation. If you have any questions, please contact Mr. Vacys Saulys or Mr. David Dolan at 312/353-1472.

Very truly yours,

A. H. Manzardo, Chief
Permit Branch

cc: Mr. W. H. Busch, Illinois EPA

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Exhibit

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N P D E S
MICROFILM "JACKET" INFORMATION

1. Division Code: W
2. FIPS County Code: 097
3. City/Township Code: 190
4. Governing Body Code: 0500A
5. PERMITTEE NAME (File Subject)
   COMMONWEALTH EDISON-WAUKEGAN IL1276
6. File Division: 13
7. NPDES Number: IL0002259

CROSS-REFERENCE INFORMATION

8. Governing Body Name
   COMMONWEALTH EDISON COMPANY
9. F/S/P Code: _____
10. Date Identified In The Name Field Refers To:
    a. Permit Issue Date: 12-30-76
    b. Permit Cancellation Date: __-__-__
    c. No Permit Required Date: __-__-__
11. Permit Expiration Date: 10-01-79

DWPC Records Unit
ADM 1079

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MODIFIED PERMIT
COMMONWEALTH EDISON COMPANY
(Waukegan Generating Station)
IL 0002259 Log #73-72 CMU/2C
ISSUED: 12-30-76
EXPIRES: 10-01-79

CERTIFIED MAIL
RETURN RECEIPT REQUESTED

Mr. Byron Lee, Vice-President
Commonwealth Edison Company
Post Office Box 767
Chicago, Illinois 60690
Attention: Mr. John Hughes

Re: See Attached List

Dear Mr. Lee:

Attached please find the above referenced permits, which supersedes the permits of the same numbers issued to the Commonwealth Edison Company on the dates stated on the attachment.

The permits incorporate all the changes contained in the respective Stipulations agreed to by the parties to the modification and adjudicatory proceedings. One copy each of the respective Stipulations, the Administrative Law Judge's Certification and the Regional Administrator's Approval are also enclosed. Please return the original permits listed in the attachment to this office.

FILE 116

The permits dated today are in full force and effective immediately and compliance with all the terms and conditions thereof is required.

Thank you for your cooperation in this matter.

Very truly yours,

Dale S. Bryson, Acting Director
Enforcement Division

Enclosures

cc: Mr. W. H. Busch, Illinois Environmental Protection Agency, w/ Permits

Mr. D. Feldman, Attorney for Commonwealth Edison, w/Permits

RECEIVED
JAN 03 1977
ENVIRONMENTAL PROTECTION AGENCY
DIV. OF WATER POLLUTION CONTROL
RECORDS UNIT — SPRINGFIELD
STATE OF ILLINOIS

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COMMONWEALTH EDISON
ATTACHMENT

Names and Addresses of Facilities Where Discharges Occur:	Permit Number: Date Permits Issued on: Receiving Water:
Permits Being Modified	
Zion Generating Station 101 Shiloh Boulevard Zion, Illinois 60099	IL 0002763 November 29, 1974 Lake Michigan
Waukegan Generating Station Greenwood & Lake Michigan (m) Waukegan, Illinois 60085	IL 0002259 November 27, 1974 Lake Michigan
Byron Generating Station Near Byron (Ogle Co.), Illinois	IL 0048313 November 11, 1975 Illinois River
Braidwood Generating Station 1/2 mile south of Route 53, 1/2 mile East of Godley, Will County	IL 0048321 November 11, 1975 Mazon River and the Kankakee River
LaSalle Generating Station Units 1 and 2 LaSalle County, Illinois	IL 0048151 April 19, 1976 Illinois River
Permits Being Reissued	
Dixon Generating Station 919 W. First Street Dixon, Illinois 61021	IL 0003026 September 30, 1974 Rock River
Kincaid Generating Station Rt. 104, 4 miles West of Kincaid Kincaid, Illinois 62540	IL 0002241 November 21, 1974 Lake Sangchris
Powerton Generating Station P. O. Box 158 Pekin, Illinois 61554	IL 0002232 September 25, 1974 Illinois River & Mackinaw Cutoff

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DIV. OF WATER POLLUTION CONTROL
RECORDS UNIT — SPRINGFIELD
STATE OF ILLINOIS

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Fisk Generating Station
1111 W. Cermak Road
Chicago, Illinois 60608

IL 0002178
August 1, 1974
So. Branch of Chicago River

Crawford Generating Station
3501 So. Pulaski Road
Chicago, Illinois 60623

IL 0002186
September 30, 1974 modified on
September 29, 1975
Chicago, Sanitary and Ship Canal

Ridgeland Generating Station
43[illegible] So. Ridgeland
Stickney, Illinois 60402

IL 0002194
October 22, 1974 modified on
September 26, 1975
Chicago Sanitary and Ship Canal

Will County Generating Station
Romeo Road - East of Rt. 53
Joliet, Illinois 60435

IL 0002208
October 29, 1974
Chicago Sanitary and Ship Canal
and Des Plaines River

Joliet Generating Station
Joliet, Illinois

IL 0002216
October 29, 1974
DesPlainess River

Dresden Generating Station
Lorenzo Road, 4 miles West of I-55
Morris, Illinois 60450

IL 0002224
September 26, 1974
Illinois River

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JAN 03 1977
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DIV. OF WATER POLLUTION CONTROL
RECORDS UNIT — SPRINGFIELD
STATE OF ILLINOIS

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Permit No. IL 0002259

Application No. IL 0002259

As Modified On

RECEIVED
JAN 03 1977
ENVIRONMENTAL PROTECTION AGENCY
DIV. OF WATER POLLUTION CONTROL
RECORDS UNIT — SPRINGFIELD
STATE OF ILLINOIS

AUTHORIZATION TO DISCHARGE UNDER THE NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM

In compliance with the provisions of the Federal Water Pollution Control Act, as amended, (33 U.S.C. 1251 et seq; the "Act"),

COMMONWEALTH EDISON COMPANY

is authorized by the United States Environmental Protection Agency, Region V,

to discharge from a facility located at Waukegan Generating Station
Greenwood Ave. and Lake Michigan
Waukegan, Illinois 60085
Lake County

to receiving waters named Lake Michigan

in accordance with effluent limitations, monitoring requirements and other conditions set forth in Parts I, II, and III hereof.

This permit and the authorization to discharge shall expire at midnight, October 1, 1979 . Permittee shall not discharge after the above date of expiration. In order to receive authorization to discharge beyond the date of expiration, the permittee shall submit such information, forms, and fees as are required by the Agency authorized to issue NPDES permits no later than 180 days prior to the above date of expiration.

This permit, modified in accordance with 40 CFR 125, shall become effective upon this date of signature and supersedes NPDES Permit number IL 0002259 , dated November 27, 1974.

Signed this DEC 30 1976

Dale S. Bryson

Acting Director, Enforcement Division

Electronic Filing: Received, Clerk's Office 10/31/2022

Permit No. IL 0002259

As Modified On DEC 31 1976

PART I

A. 1. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

Beginning on the effective date of this modification and lasting until July 1, 1977 the permittee is authorized to discharge from outfall(s) serial number(s) 001(a)-Condenser Cooling Water, Demineralizer Filter Backwash, Boiler Blowdown and House Service Water. Such discharges shall be limited and monitored by the permittee as specified below:

EFFLUENT CHARACTERISTIC	DISCHARGE LIMITATIONS kg/day (lbs/day) Daily Avg(1)	Daily Max(1)	Other Units (Specify) Daily Avg(1)	Daily Max(1)	MONITORING REQUIREMENTS Measurement Frequency	Sample Type
Flow-M^3/Day (MGD)(2)	-	-	-	-	Continuous	-
Temperature c(°F)(2)	-	-	-	-	Continuous	-
Free Chlorine Residual(3)	-	-	0.2 mg/l	0.5 mg/l	Once/7 Days	Grab
Total Chlorine Residual(3)	-	-	-	-	Once /7 Days	Grab
Heat Rejection Rate (BTU/Hr)	-	-	-	-	Monthly Max.	Report
Plant Capacity Factor (%)	-	-	-	-	Monthly Avg.	Report

(1) See Part I-C.4. for definition.
(2) Intake and Discharge temperatures.
(3) See Part III-A.7 for additional chlorine limitations and monitoring requirements. Chlorination period not to exceed a total of 2 hours per day per unit. The frequency and duration of chlorination on a per unit basis shall be reported on the Discharge Monitoring Report.

There shall be no discharge of floating solids or visible foam in other than trace amounts.

Samples taken in compliance with the monitoring requirements specified above shall be taken at the following location(s): At a point representative of the discharge but prior to entry into Lake Michigan.

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Permit No. IL 0002259
As Modified On DEC 30 1976

PART I

A.2. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

Beginning on the effective date of this modification and lasting until July 1, 1977 the permittee is authorized to discharge from outfall(s) serial number(s) 001(b)-Demineralizer Regenerant Waste

Such discharges shall be limited and monitored by the permittee as specified below:

EFFLUENT CHARACTERISTIC	DISCHARGE LIMITATIONS kg/day (lbs/day) Daily Avg (1)	Daily Max (1)	Other Units (Specify) Daily Avg (1)	Daily Max (1)	MONITORING REQUIREMENTS Measurement Frequency	Sample Type
Flow-M^3/Day (MGD)	-	-	-	-	When Sampling 1 Discharge Period Per 7 days	-
Dissolved Solids	-	-	-	-		24-Hr. Composite

(1) See Part I-C.4 for definition.

There shall be no discharge of floating solids or visible foam in other than trace amounts.

Samples taken in compliance with the monitoring requirements specified above shall be taken at the following location(s): At a point representative of the discharge but prior to mixing with other waters.

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Permit No. IL 0002259

As Modified On DEC 9 0 1976

PART I

A.3. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

Beginning on the effective date of this modification and lasting until July 1, 1977 the permittee is authorized to discharge from outfall(s) serial number(s) 002 -Ash Pond Overflow

Such discharges shall be limited and monitored by the permittee as specified below:

EFFLUENT CHARACTERISTIC	DISCHARGE LIMITATIONS kg/day (lbs/day) Daily Avg(1)	Daily Max(1)	Other Units (Specify) Daily Avg(1)	Daily Max(1)	MONITORING REQUIREMENTS Measurement Frequency	Sample Type
Flow-M^3/Day (MGD)	-	-	-	-	When Sampling	-
Suspended Solids	-	-	-	-	One Day/7 Days	24 Hr. Composite
Dissolved Solids	-	-	-	-	One Day/7 Days	24 Hr. Composite
Oil and Grease	-	-	-	-	Once/7 Days	Grab
Iron (Total)	-	-	-	2.0 mg/l	One Day/Month	24 Hr. Composite
Iron (Dissolved)	-	-	-	0.5 mg/l	One Day/Month	24 Hr. Composite
Copper (Total)	-	-	-	-	One Day/Month	24 Hr. Composite

(1) See Part I-C.4 for definition.

The pH shall not be less than 6.0 nor greater than 9.0 and shall be monitored by grab sample measured once per 7 days.

There shall be no discharge of floating solids or visible foam in other than trace amounts.

Samples taken in compliance with the monitoring requirements specified above shall be taken at the following location(s): At a point representative of combined discharge at the confluence of the two unnamed ditches in the south-east corner of the facility.

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Permit No. IL 0002259
As Modified On DEC 30 1976

PART I

A.4. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

During the period beginning July 1, 1977 and lasting until October 1, 1979
the permittee is authorized to discharge from outfall(s) serial number(s) 001(a)-Condenser Cooling Water and House Service Water

Such discharges shall be limited and monitored by the permittee as specified below:

EFFLUENT CHARACTERISTIC	DISCHARGE LIMITATIONS kg/day (lbs/day) Daily Avg (1)	kg/day (lbs/day) Daily Max (1)	Other Units (Specify) Daily Avg (1)	Other Units (Specify) Daily Max (1)	MONITORING REQUIREMENTS Measurement Frequency	Sample Type
Flow-M^3/Day (MGD) (2)	-	-	-	-	Continuous	-
Temperature ^{o}C (^{o}F) (2)	-	-	-	-	Continuous	-
Free Chlorine Residual (3)	-	-	-	-	Once/7 Days	Grab
Total Chlorine Residual (3)	-	-	-	-	Once/7 Days	Grab
Heat Rejection Rate (BTU/Hr.)	-	-	-	-	Monthly Max.	Report
Plant Capacity Factor (%)	-	-	-	-	Monthly Avg.	Report

(1) See Part I-C.4 for definition
(2) Intake and Discharge temperatures.
(3) See Part III-A.7 for additional chlorine limitations and monitoring requirements.
The frequency and duration of chlorination on a per unit basis shall be reported on the Discharge Monitoring Report.

The pH shall not be less than 6.0 nor greater than 9.0
and shall be monitored by grab sample measured once per 7 days.

There shall be no discharge of floating solids or visible foam in other than trace amounts.

Samples taken in compliance with the monitoring requirements specified above shall be taken at the following location(s): At a point representative of the discharge but prior to entry into Lake Michigan.

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Permit No. IL 0002259
As Modified On DEC 3 0 1976

PART I

A. 5. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

During the period beginning July 1, 1977 and lasting until October 1, 1979
the permittee is authorized to discharge from outfall(s) serial number(s) 001(b)-Demineralizer Regenerant Waste

Such discharges shall be limited and monitored by the permittee as specified below:

EFFLUENT CHARACTERISTIC	DISCHARGE LIMITATIONS kg/day (lbs/day) Daily Avg(1)	kg/day (lbs/day) Daily Max(1)	Other Units (Specify) Daily Avg(1)	Other Units (Specify) Daily Max(1)	MONITORING REQUIREMENTS Measurement Frequency	Sample Type
Flow-M³/Day (MGD)	-	-	-	-	When Sampling	-
Suspended Solids	-	-	-	15 mg/l	1 Discharge Period Per 7 Days	Composite @ Half-Hour Intervals
Iron (Total)	-	-	-	2.0 mg/l	One/7 Days	Grab
Copper (Total)	-	-	-	1.0 mg/l	One/7 Days	Grab

(1) See Part I-C.4 for definition.

There shall be no discharge of floating solids or visible foam in other than trace amounts.

Samples taken in compliance with the monitoring requirements specified above shall be taken at the following location(s): At a point representative of the discharge but prior to entry into the discharge flume.

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Permit No. IL 0002259 (Per USEPA) (1-13-77)

As Modified On DEC 30 1976

PART I

A.7 EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

During the period beginning July 1, 1977 and lasting until October 1, 1979
the permittee is authorized to discharge from outfall(s) serial number(s) 001(d) - Treated Floor Drain and Roof and Yard Effluents

Such discharges shall be limited and monitored by the permittee as specified below:

EFFLUENT CHARACTERISTIC	DISCHARGE LIMITATIONS kg/day (lbs/day) Daily Avg (2)	kg/day (lbs/day) Daily Max (2)	Other Units (Specify) Daily Avg (2)	Other Units (Specify) Daily Max (2)	MONITORING REQUIREMENTS (2) Measurement Frequency	Sample Type
Flow-M³/Day (MGD)	-	-	-	-	When Sampling	-
Suspended Solids	-	-	-	15 mg/l	One Day/7 Days	Composite
Oil and Grease	-	-	-	15 mg/l	Once/7 Days	Grab

(1) During periods of discharge.
(2) See Part I-C.4 for definition.

The pH shall not be less than 6.0 nor greater than 9.0 and shall be monitored by grab sample measured once per 7 days.

There shall be no discharge of floating solids or visible foam in other than trace amounts.

Samples taken in compliance with the monitoring requirements specified above shall be taken at the following location(s): At a point representative of the discharge but prior to entry into the discharge flume.

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Permit No. IL 0002259

As Modified On DEC 30 1976

PART I

A8. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

During the period beginning July 1, 1977 and lasting until October 1, 1979
the permittee is authorized to discharge from outfall(s) serial number(s) 001(e) - Recirculating Combined Waste Treatment System Blowdown

Such discharges shall be limited and monitored by the permittee as specified below:

EFFLUENT CHARACTERISTIC	DISCHARGE LIMITATIONS kg/day (lbs/day) Daily Avg (2)	Daily Max (2)	Other Units (Specify) Daily Avg (2)	Daily Max (2)	MONITORING REQUIREMENTS (1) Measurement Frequency	Sample Type
Flow-M^3/Day (MGD)	-	-	-	-	When Sampling	-
Suspended Solids	-	-	-	15 mg/l	One Day / 7 Days	24 Hr. Composite
Dissolved Solids	-	-	-	3500 mg/l	One Day / 7 Days	24 Hr. Composite
Oil and Grease	-	-	-	15 mg/l	Once / 7 Days	Grab
Iron (Total)	-	-	-	2.0 mg/l	Once/3 Months	Grab
Iron (Dissolved)	-	-	-	0.5 mg/l	Once/3 Months	Grab

(1) See Part III-A.6.a for special monitoring requirements in the event that metal cleaning wastes are discharged to the recirculating combined waste treatment system.
(2) See Part I-C.4 for definition.

The pH shall not be less than 6.0 nor greater than 9.0 and shall be monitored by grab sample measured once per 7 days.

There shall be no discharge of floating solids or visible foam in other than trace amounts.

Samples taken in compliance with the monitoring requirements specified above shall be taken at the following location(s): At a point representative of the discharge but prior to entry into the discharge flume.

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Permit No. IL 0002259

As Modified On DEC 30 1976

PART I

A. 9 EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

During the period beginning July 1, 1977 and lasting until October 1, 1979
the permittee is authorized to discharge from outfall(s) serial number(s) 002 - Coal Pile Runoff Collection Basin Discharge

Such discharges shall be limited and monitored by the permittee as specified below:

EFFLUENT CHARACTERISTIC	DISCHARGE LIMITATIONS kg/day (lbs/day) Daily Avg (2)	kg/day (lbs/day) Daily Max (2)	Other Units (Specify) Daily Avg (2)	Other Units (Specify) Daily Max (2)	MONITORING REQUIREMENTS (1) Measurement Frequency	Sample Type
Flow-M^3/Day (MGD)	-	-	-	-	When Sampling 1 Discharge Period per 7 Days	-
Suspended Solids	-	-	-	15 mg/l		Composite
Oil and Grease	-	-	-	15 mg/l	Once / 7 Days	Grab

(1) During periods of discharge
(2) See Part I-C.4 for definition

The pH shall not be less than 6.0 nor greater than 9.0
and shall be monitored by grab sample measured once per 7 days.

There shall be no discharge of floating solids or visible foam in other than trace amounts.

Samples taken in compliance with the monitoring requirements specified above shall be taken at the following location(s): At a point representative of the discharge but prior to entry into Lake Michigan.

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B. SCHEDULE OF COMPLIANCE

1. The permittee shall achieve compliance with the effluent limitations specified for discharges in accordance with the following schedule:

a. Neutralization, Recirculating Combined, Metal Cleaning, Combined Bilge and Drain, and Coal Pile Runoff Waste Treatment Systems
   (1) Preliminary Plans Submitted by May 1, 1976 *
   (2) Construction Progress Report by December 31, 1976
   (3) Attainment of Operational Level by July 1, 1977

b. Chlorine Application Point Relocation Project Operational by January 31, 1977

c. Thermal Reduction
   (1) Completion of Preliminary Plans by December 31, 1974
   (2) Deadline for Successful 316(a) Demonstration by October 1, 1975
   (3) Completion of Final Plans by December 31, 1975
   (4) Commencement of Construction by March 31, 1976
   (5) Report of Construction Progress by September 30, 1976
   (6) Completion of Construction by March 31, 1977
   (7) Attainment of Operational Level by July 1, 1977

*Completed

2. No later than 14 calendar days following a date identified in the above schedule of compliance, the permittee shall submit either a report of progress or, in the case of specific actions being required by identified dates, a written notice of compliance or noncompliance. In the latter case, the notice shall include the cause of non-compliance, any remedial actions taken, and the probability of meeting the next scheduled requirements.

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Permit No. IL 0002259
As Modified On DEC 30 1976

C. MONITORING AND REPORTING

1. Representative Sampling - Samples and measurements taken as required herein shall be representative of the volume and nature of the monitored discharge.

2. Reporting - The permittee shall record monitoring results on Discharge Monitoring Report forms, using one such form for each discharge each month. The completed monthly forms shall be retained by permittee for a period of three months beginning with each calendar quarter, and the forms from those three months shall be mailed to USEPA no later than the 28th day of the following month; i.e. (a) January, February, March (submit April 28); (b) April, May, June (submit July 28); (c) July, August, September (submit October 28); October, November, December (submit January 28).

The permittee shall retain a copy of all reports submitted. All reports shall be submitted to:

U.S. Environmental Protection Agency
Attention: Chief, Compliance Unit
230 South Dearborn Street
Chicago, Illinois 60604

The permittee shall submit these monitoring reports each month to the State Agency by the 15th day of the following month at the following address:

Manager
Illinois EPA-DWPC Region 2C
1701 First Avenue
Maywood, Illinois 60153

3. Noncompliance Notification - If, for any reason, the permittee does not comply with or will be unable to comply with any daily maximum effluent limitation specified in this permit, the permittee shall provide the Regional Administrator and the State with the

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following information, in writing within five (5) days of becoming aware of such condition: (a) a description of the discharge; (b) cause of noncompliance; (c) the period of noncompliance, including exact dates and times; (d) if not corrected, the anticipated time the noncompliance is expected to continue, and (e) steps being taken to reduce, eliminate and prevent recurrence of the noncomplying discharge.

4. Definitions

a. "Daily Average" Discharge

1. Weight Basis - The "daily average" discharge means the total discharge by weight during a calendar month divided by the number of days in the month that the production or commercial facility was operating. Where less than daily sampling is required by this permit, the daily average discharge shall be determined by the summation of the measured daily discharge by weight divided by the number of days during the calendar month when the measurements were made.

2. Concentration Basis - The "daily average" concentration means the arithmetic average (weighted by flow value) of all the daily determinations of concentration made during a calendar month. Daily determinations of concentration made using a composite sample shall be the concentration of the composite sample. When grab samples are used, the daily determination of concentration shall be the arithmetic average (weighted by flow value) of all the samples collected during the calendar day.

b. "Daily Maximum" Discharge

1. Weight Basis - The "daily maximum" discharge means the total discharge by weight during any calendar day.

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2. Concentration Basis - The "daily maximum" concentration means the daily determination of concentration for any calendar day.

5. Test Procedures - Test procedures for the analysis of pollutants shall conform to regulations published pursuant to Section 304(g) of the Act, under which such procedures may be required.

6. Recording of Results - For each measurement or sample pursuant to the requirements of this permit the permittee shall record the following information: (a) the exact place, date, and time of sampling; (b) the dates the analyses were performed; (c) the person(s) who performed the analyses; (d) the analytical techniques or methods used; and (e) the results of all required analyses.

7. Additional Monitoring by Permittee - If the permittee monitors any pollutant at the location(s) designated herein more frequently than required by this permit, using approved analytical methods as specified above, the results of such monitoring shall be included in the calculation and reporting of the values required in the Discharge Monitoring Report Form (EPA No. 3320-1). Such increased frequency shall also be indicated.

8. Records Retention - All records and information resulting from the monitoring activities required by this permit including all records of analyses performed and calibration and maintenance of instrumentation and recordings from continuous monitoring instrumentation shall be retained for a minimum of three (3) years, or longer if requested by the Regional Administrator or the State Water Pollution Control Agency.

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PART II

A. MANAGEMENT REQUIREMENTS

1. Change in Discharge - All discharges authorized herein shall be consistent with the terms and conditions of this permit. The discharge of any pollutant identified in this permit more frequently than or at a level in excess of that authorized shall constitute a violation of the permit. Any anticipated facility expansions, production increases, or process modifications which will result in new, different, or increased discharges of pollutants must be reported by submission of a new NPDES application or, if such changes will not violate the effluent limitations specified in this permit, by notice to the permit issuing authority of such changes. Following such notice, the permit may be modified to specify and limit any pollutants not previously limited.

2. Facilities Operation - The permittee shall at all times maintain in good working order and operate as efficienty as possible all treatment or control facilities or systems installed or used by the permittee to achieve compliance with the terms and conditions of this permit.

3. Adverse Impact - The permittee shall take all reasonable steps to minimize any adverse impact to navigable waters resulting from noncompliance with any effluent limitations specified in this permit, including such accelerated or additional monitoring as necessary to determine the nature and impact of the noncomplying discharge.

4. Bypassing - Any diversion from or bypass of facilities necessary to maintain compliance with the terms and conditions of this permit is prohibited, except (i) where unavoidable to prevent loss of life or severe property

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damage, or (ii) where excessive storm drainage or runoff would damage any facilities necessary for compliance with the effluent limitations and prohibitions of this permit. The permittee shall promptly notify the Regional Administrator and the State in writing of each such diversion or bypass.

5. Removed Substances - Solids, sludges, filter backwash, or other pollutants removed from or resulting from treatment or control of wastewaters shall be disposed of in a manner such as to prevent any pollutant from such materials from entering navigable waters.

6. Power Failures - In order to maintain compliance with the effluent limitations and prohibitions of this permit, the permittee shall either: (a) in accordance with the Schedule of Compliance contained in Part I, provide an alternative power source sufficient to operate the wastewater control facilities; or, if no date implementation appears in Part I, (b) halt, reduce or otherwise control production and/or all discharges upon the reduction, loss, or failure of one or more of the primary sources of power to the wastewater control facilities.

B. RESPONSIBILITIES

1. Right of Entry - The permittee shall allow the head of the State Water Pollution Control Agency, the Regional Administrator, and/or their authorized representatives, upon the presentation of credentials: (a) to enter upon the permittee's premises where an effluent source is located or in which any records are required to be kept under the terms and conditions of this permit; and (b) at reasonable times to have access to and copy any records required to be kept under the terms and conditions of this permit; to inspect any monitoring equipment or monitoring method required in this permit; and to sample any discharge of pollutants.

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2. Transfer of Ownership or Control - In the event of any changes in control or ownership of facilities from which the authorized discharges emanate, the permittee shall notify the succeeding owner or controller of the existence of this permit by letter, a copy of which shall be forwarded to the Regional Administrator and the State Water Pollution Control Agency.

3. Availability of Reports - Except for data determined to be confidential under Section 308 of the Act, all reports prepared in accordance with the terms of this permit shall be available for public inspection at the offices of the State Water Pollution Control Agency and the Regional Administrator. As required by the Act, effluent data shall not be considered confidential. Knowingly making any false statement on any such report may result in the imposition of criminal penalties as provided for in Section 308 of the Act.

4. Permit Modification - After notice and opportunity for a hearing, this permit may be modified, suspended, or revoked in whole or in part during its term for cause including, but not limited to, the following: (a) violation of any terms or conditions of this permit; (b) obtaining this permit by misrepresentation or failure to disclose fully all relevant facts; or (c) a change in any condition that requires either a temporary or permanent reduction or elimination of the authorized discharge.

5. Toxic Pollutants - Notwithstanding Part II, B-4 above, if a toxic effluent standard or prohibition (including any schedule of compliance specified in such effluent standard or prohibition) is established under Section 307(a) of the Act for a toxic pollutant which is present in the discharge and such standard or prohibition is more stringent than any limitation for such pollutant in this permit, this permit shall be revised or modified in accordance with the toxic effluent standard or prohibition and the permittee is notified.

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Permit No. IL 0002259
As Modified On DEC 30 1976

6. Civil and Criminal Liability - Except as provided in permit conditions on "Bypassing" (Part II, A-4) and "Power Failure" (Part II, A-6), nothing in this permit shall be construed to relieve the permittee from civil or criminal penalties for noncompliance.

7. Oil and Hazardous Substance Liability - Nothing in this permit shall be construed to preclude the institution of any legal action or relieve the permittee from any responsibilities, liabilities, or penalties to which the permittee is or may be subject under Section 311 of the Act.

8. State Law - Nothing in this permit shall be construed to preclude the institution of any legal action or relieve the permittee from any responsibilities, liabilities, or penalties established pursuant to any applicable State law or regulation under authority preserved by Section 510 of the Act.

9. Property Rights - The issuance of this permit does not convey any property rights in either real or personal property, or any exclusive privileges, nor does it authorize any injury to private property or any invasion of personal rights, nor any infringement of Federal, State or local laws or regulations.

10. Severability - The provisions of this permit are severable, and if any provision of this permit or the application of any provision of this permit to any circumstance, is held invalid, the application of such provision to other circumstances, and the remainder of this permit, shall not be affected thereby.

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Part III

A. Other Requirements

1. Provisions for Change of Monitoring Frequency

If the permittee after monitoring for at least six (6) months determines that he is consistently meeting the effluent limits contained herein, the permittee may request the Regional Administrator and the Director that the monitoring requirements be reduced to twice monthly, monthly or be eliminated. Upon written notification by the Regional Administrator and the Director, the Permittee will monitor as directed.

2. Additional State Requirements

This permit incorporates all applicable provisions of the Illinois Environmental Protection Act and of the Rules and Regulations of Illinois Pollution Control Board, as if they were set forth herein. All such provisions shall become conditions of this Federal NPDES permit as provided by Section 401(d) of the Federal Water Pollution Control Act Amendments of 1972.

3. Prohibited Discharges

a. This permit is specifically for the listed pollutants to be discharged from the designated outfalls only. Discharge of pollutants from an undesignated outfall is not permitted.

b. There shall be no discharge of debris from intake screen washing operations.

c. There shall be no discharge of polychlorinated biphenyl compounds.

d. There shall be no discharge of water side boiler cleaning wastes.

4. Intake Monitoring Requirements

The final report of the intake monitoring program submitted by the permittee on July 9, 1976 is being evaluated with regard to Section

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316(b) of the Act. The Regional Administrator and the Director, after evaluation of the report, may modify the permit in accordance with Part II-B.4 to establish an implementation schedule to insure compliance with Section 316(b).

5. Thermal Discharge Limitations

During the period beginning July 1, 1977 and lasting until October 1, 1979 the permittee is authorized to discharge from outfalls serial number 001.(1)

Such discharges shall be limited and monitored by the permittee as specified below:

i. The heated effluent shall at no time raise the natural temperature of Lake Michigan more than 3°F at the edge of the mixing zone.

ii. The water temperature at the edge of the mixing zone, and at other representative locations in the Lake shall not exceed the maximum limits (°F) in the following table:

JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC
45	45	45	55	60	70	80	80	80	65	60	50

iii. The mixing zone shall be no greater than the area of a circle with a radius of 1000 ft.

6. Miscellaneous Wastes

a. After July 1, 1977 discharge of metal cleaning wastes shall be directed to the recirculating combined waste treatment system. Recirculating combined waste treatment system blowdown sampling will be performed for one day prior to discharge of these wastes into the treatment system and for three days thereafter as follows:

(1) These limitations are not applicable if the permittee's 316(a) demonstration is acceptable.

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Parameter	Daily Max (1)	Measurement Frequency	Sample Type
Flow	-	Continuous	-
Suspended Solids	15 mg/l	Daily	24-Hr. Composite @ Half-Hour Intervals
Dissolved Solids	3500 mg/l	Daily	24-Hr. Composite @ Half-Hour Intervals
Oil and Grease	15 mg/l	Daily	Grab
Copper (Total)	1.0 mg/l	Daily	24-Hr. Composite @ Half-Hour Intervals
Iron (Total)	2.0 mg/l	Daily	24-Hr. Composite @ Half-Hour Intervals
Zinc (Total)	1.0 mg/l	Daily	24-Hr. Composite @ Half-Hour Intervals
Chromium (Total) Hexavalent	0.3 mg/l	Daily	24-Hr. Composite @ Half-Hour Intervals
Alkalinity (Total)	-	Daily	Grab
Chromium Trivalent (Total)	1.0 mg/l	Daily	24-Hr. Composite @ Half-Hour Intervals

The pH shall not be less than 6.0 nor greater than 9.0 and shall be monitored by daily grab samples.

The results of this sampling shall be reported together with the volume of the metal cleaning wastes pursuant to the reporting requirements of Part I-C.2 of this permit.

b. After July 1, 1977 liquid discharges from miscellaneous waste collection sumps, yard drains, and excess run-off from coal storage areas shall be diverted to existing ash settling basins or comparable settling facilities for treatment prior to discharge.

(1) See Part I-C.4 for definition.

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7. Chlorine Limitations And Monitoring

a. From the effective date of this permit until July 1, 1977 the permittee is limited to a free chlorine residual of 0.2 mg/l daily average and 0.5 mg/l daily maximum with the discharge of chlorine not to exceed two hours per day per unit.

b. Daily average shall be defined as the arithmetic average of the chlorine concentrations obtained using the procedure set forth in Exhibit A of the Chlorine Stipulation executed by Commonwealth Edison Company and Region V, U.S. Environmental Protection Agency on April 2, 1976.

c. The daily maximum for total residual chlorine shall be defined as the average of two highest instantaneous chlorine concentrations obtained using the procedures set forth in Exhibit A of the Chlorine Stipulation executed by Commonwealth Edison Company and Region V, U.S. Environmental Protection Agency on April 2, 1976 for each chlorination period. This definition shall also apply to daily maximum free residual chlorine until July 1, 1977. After July 1, 1977 the daily maximum for free residual chlorine shall be the single highest chlorine concentration obtained using the procedures set forth in Exhibit A of the Chlorine Stipulation executed by Commonwealth Edison Company and Region V, U.S. Environmental Protection Agency on April 2, 1976 for each chlorination period.

d. The monitoring location for chlorine residual shall be as referenced in Exhibit C-2 of the Chlorine Stipulation executed by Commonwealth Edison Company and Region V, U.S. Environmental Protection Agency on April 2, 1976.

e. The Chlorine Stipulation executed by Commonwealth Edison Company and Region V, U.S. Environmental Protection Agency, on April 2, 1976 is incorporated by reference into this permit as though fully set forth herein.

B. Modification Provision

NPDES Permit No. IL 0002259, as modified on containing herein all modifications supersedes, for all purposes on and after the date of modification, the original permit issued and dated November 27, 1974. However, this modification is not in derogation of any action heretofore taken under the original permit issued and dated November 27, 1974, nor does this modification relieve the permittee of any liability for violation of any provision of the original permit issued and dated November 27, 1974, committed prior to the effective date of this modification.

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Exhibit

38

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PERMIT/PLAN/SPECIFICATION
MICROFILM "JACKET" INFORMATION

1. Division Code: W
2. FIPS County Code: 097
3. City/Township Code: 190
4. Governing Body Code: 05004
5. PERMITTEE NAME (File Subject): COM_ED-WAUK_2ND_OPER_EXP_3/28/80
6. File Division: 03
7. IEPA Permit Number: 1977ED2715

CROSS-REFERENCE INFORMATION

8. Governing Body Name: COMMONWEALTH_EDISON_COMPANY
9. ~~F/S/P Code~~: B0133
10. NPDES Number: IL00

DWPC Records Unit

IL 532-0486
ADM 1081 8/78

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ILLINOIS ENVIRONMENTAL PROTECTION AGENCY
WATER POLLUTION CONTROL PERMIT

PERMIT NUMBER: 1977-ED-2715

DATE ISSUED: January 13, 1977
PROJECT LOG NUMBERS: 2715-76 (4553-73)

SUBJECT: COMMONWEALTH EDISON COMPANY - Waukegan Generating Station
Industrial Treatment Works

PERMITTEE TO OPERATE
Commonwealth Edison Company
Post Office Box 767
Chicago, Illinois 60690

Permit is hereby granted to the above designated permittee to operate water pollution control facilities described as follows:

Slag field and settling basin which discharges an average of 4770 GPM to an unnamed ditch tributary to Lake Michigan.

This Operating Permit expires on February 28, 1980.

The Application for Operating Permit and supporting documents approved by this Permit were prepared by Thomas F. Hemminger and are identified in the records of the Illinois Environmental Protection Agency, Division of Water Pollution Control, Permit Section by the log number(s) designated in the subject above.

Continued on Page Two

READ ALL CONDITIONS CAREFULLY:
STANDARD CONDITIONS

1. If any statement or representation is found to be incorrect, this permit may be revoked and the permittee thereupon waives all rights thereunder.

2. During or after the construction or the installation of the facilities covered by this permit any agent duly authorized by the Illinois Environmental Protection Agency shall have the right to inspect such facilities and its operation.

3. The issuance of this permit (a) shall not be considered as in any manner affecting the title of the premises upon which the permitted facilities are to be located; (b) does not release the permittee from any liability for damage to person or property caused by or resulting from the installation, maintenance or operation of the proposed facilities; (c) does not take into consideration the structural stability of any units or parts of the project, and (d) does not release the permittee from compliance with other applicable statutes of the State of Illinois, or with applicable local laws, regulations or ordinances.

4. Treatment works will be operated or supervised by a duly qualified treatment works operator certified under the Regulations of the Illinois Environmental Protection Agency.

5. The facilities covered by this permit shall be constructed and operated in compliance with the provision of the Illinois Environmental Protection Act and Chapter 3 of the Rules and Regulations as adopted by the Illinois Pollution Control Board.

6. Plans, specifications and other documentation submitted shall constitute a part of the application and when approved shall constitute part of this permit.

7. This Permit may not be assigned or transferred without a new permit from the Illinois Environmental Protection Agency.

8. There shall be no deviations from the approved plans and specifications unless revised plans, specifications and application shall first have been submitted to the Illinois Environmental Protection Agency and a supplemental permit issued.

9. The installation shall be made under the supervision of an inspector, who is familiar with the approved plans and specifications provided by and approved by the owner, and said inspector shall require that construction complies with the plans and specifications approved by this Agency.

10. Unless otherwise stated by Special Condition, construction must be completed in three years for treatment works and two years for sewers and wastewater sources.

11. Discharges into the sanitary sewer(s) constructed under this permit shall consist of wastewater only. Storm waters shall not be permitted to enter the sanitary sewer(s). Roof and footing drains shall not be connected to the sanitary sewer(s) constructed under this permit.

This permit is issued in accordance with the Illinois Environmental Protection Act of 1970 and the Chapter III Water Pollution Regulations adopted pursuant thereto by the Illinois Pollution Control Board.

WHB:ML:bs/B4-6

cc: Region II
Thomas E. Hemminger

DIVISION OF WATER POLLUTION CONTROL

William H. Busch,
Manager, Permit Section

WPC 146

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ILLINOIS ENVIRONMENTAL PROTECTION AGENCY
WATER POLLUTION CONTROL PERMIT

PERMIT NUMBER: 1977-ED-2715

DATE ISSUED: January 13, 1977
PROJECT LOG NUMBERS: 2715-76 (4553-73)

SUBJECT: COMMONWEALTH EDISON COMPANY - Waukegan Generating Station
Industrial Treatment Works

This Permit renews and replaces Permit Number 1974-EB-346-OP which was previously issued for the herein permitted facilities.

This Permit is issued subject to the following Special Condition(s). If such Special Condition(s) require(s) additional or revised facilities, satisfactory engineering plan documents must be submitted to this Agency for review and approval for issuance of a Supplemental Permit.

This permit is for the slag field and settling basin discharge (002) only and does not include the cooling water discharge (001).

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#2715-76

ENVIRONMENTAL PROTECTION AGENCY

Comm. Ed. Co

Waukegan Generating Station

Reviewed by Mut Leeds Date 1/3/77

Design Engr:

Thomas E. Hemminger
Comm. Ed. Co. 312/294-2989
P.O. Box 767
Chicago, Illinois 60690

Proposed:

Renewal of Operating Permit for Waukegan Station Slag Field and Ash Settling Basin.
Original Permit # 1974-EB-346-OP
Expiration Date => 2/28/77

NPDES Requirements (Ash Pond)

TDS → 750
SS → .15
Oil/Grease → 15.
(Total) Iron → 2.0
Iron → 0.5.0
N. → 1

(Demineralizer Regenerant)
DS → 8540 (not the effluent)

A speck with R. Springer, FOS, indicates this discharge (002) has substantially been in compliance with Chapter 3 Effluent Requirements.

Will issue renewal for 3 yrs.

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FOR IEPA USE: 1417
LOG: 2775-76
DATE RECEIVED: (4553-73)

ILLINOIS ENVIRONMENTAL PROTECTION AGENCY
DIVISION OF WATER POLLUTION CONTROL
PERMIT SECTION
Springfield, Illinois 62706

RECEIVED
DEC 01 1976
ENVIRONMENTAL PROTECTION AGENCY
DIV. OF WATER POLLUTION CONTROL
RECORDS UNIT — SPRINGFIELD
STATE OF ILLINOIS

APPLICATION FOR PERMIT OR CONSTRUCTION APPROVAL

WPC-PS-1

1. NAME AND LOCATION:

Name of project: Waukegan Generating Station

Municipality or Township Waukegan County Lake

2. BRIEF DESCRIPTION OF PROJECT: Wastewater Treatment Facilities - Slag Field and Settling Basin

3. DOCUMENTS BEING SUBMITTED: If the project involves any of the items listed below, submit the corresponding schedule, and check the appropriate spaces.

PROJECT

Private Sewer Connection	A___	Industrial Treatment or Pretreatment	J___
Public Sewer Extension	B___	Deepwell Injection	K___
Sewer Extension Construct Only	C___	Cyanide Acceptance	L___
Sewage Treatment Works	D___	Updating Cyanide Acceptance Form	M___
Excess Flow Treatment	E___	Waste Characteristics	N X
Lift Station/Force Main	F___	NPDES - Municipal	O___
Sludge Disposal	G___	NPDES - Agricultural	P___
Spray Irrigation	H___	NPDES - Industrial	Q___
Septic Tanks	I___	Others	___

Plans: Title Submitted with Original Application

Number of Pages ____

Specifications: Title Submitted with Original Application

Number of Books/Pages ____

Other Documents (Please Specify) ____

4. This is an Application for: Construction Permit ____, Operating Permit X, Joint Construction and Operating ____, Construction Approval ____, NPDES Permit ____, Cyanide Acceptance Permit ____, or Other Permit ____.

5. CERTIFICATIONS AND APPROVAL

5.1 Certificate by Design Engineer

I hereby certify that I am familiar with the information contained in this application and that to the best of my knowledge and belief such information is true, complete and accurate.

ENGINEER Thomas E. Hemminger (NAME) 62-25580 (REGISTRATION NUMBER)

FIRM Commonwealth Edison Company

ADDRESS P.O. Box 767, Chicago, Illinois 60690

SIGNATURE Thomas E Hemminger PHONE NUMBER 312/294-2989

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Certificate by Applicant

I/We hereby certify that I/we have read and thoroughly understand the conditions and requirements of this Application. I/We hereby agree to conform with the Standard Conditions and with any other Special Conditions made part of the Permit.

5.2.1 NAME OF APPLICANT FOR PERMIT TO CONSTRUCT _____

STREET _____ CITY _____ STATE _____ ZIP CODE _____

SIGNATURE _____ DATE _____

TITLE _____

5.2.2 NAME OF APPLICANT FOR PERMIT TO OWN AND OPERATE Commonwealth Edison Company

P. O. Box 767 Chicago Illinois 60690

STREET CITY STATE ZIP CODE

SIGNATURE Byron Lee Jr DATE 11-24-76

TITLE Vice President

5.3 Attested (Units of Government)

DATE _____ SIGNATURE _____ TITLE _____

(CITY CLERK, VILLAGE CLERK, SANITARY DISTRICT CLERK, ET CETERA)

5.4 Applications from non-governmental applicants which are not signed by the owner, must be accompanied by evidence of authority to sign the application.

5.5 Certificate by INTERMEDIATE SEWER OWNER

I hereby certify that the sewers to which this project will be tributary have adequate reserve capacity to transport the wastewater that will be added by this project without causing a violation of the Environmental Protection Act or Chapter 3 of the Regulations as adopted by the Illinois Pollution Control Board.

Name of sewer system to which this project will be tributary:

NAME OF SEWER SYSTEM OWNER _____

STREET _____ CITY _____ STATE _____ ZIP CODE _____

SIGNATURE _____ DATE _____ TITLE _____

5.6 Certificate by Waste Treatment Works Owner

I hereby certify that the treatment works to which this project will be tributary have adequate reserve capacity to treat the wastewater that will be added by this project without causing a violation of the Environmental Protection Act or Chapter 3 of the Regulations as adopted by the Illinois Pollution Control Board.

TREATMENT WORKS OWNER _____

STREET _____ CITY _____ STATE _____ ZIP CODE _____

SIGNATURE _____ DATE _____ TITLE _____

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FOR IEPA USE: 1/4/74
LOG: 10945-76 (4553-73)
DATE RECEIVED:

RECEIVED
DEC 01 1976
ENVIRONMENTAL PROTECTION AGENCY
DIV. OF WATER POLLUTION CONTROL
RECORDS UNIT — SPRINGFIELD
STATE OF ILLINOIS

ILLINOIS ENVIRONMENTAL PROTECTION AGENCY
DIVISION OF WATER POLLUTION CONTROL
PERMIT SECTION
Springfield, Illinois 62706

SCHEDULE N WASTE CHARACTERISTICS

1. Name of project Waukegan Generating Station - Ash Settling Pond

2. FLOW DATA

	EXISTING	PROPOSED-DESIGN
2.1 Average Flow (gpd)*	(Estimated) 4,425,000	N.A. (Not Applicable)
2.2 Maximum Daily Flow (gpd)	*(Estimated)7,000,000	N.A.

2.3 TEMPERATURE

Time of year	Avg. Intake Temp. F	Avg. Effluent Temp. F	Max. Intake Temp. F	Max. Effluent Temp. F	Max. Temp. Outside Mixing Zone F
SUMMER (Jun.Jul.Aug.Sept.)	65.5	Ambient Temp.	83	Ambient Temp.	
WINTER (Dec.Jan.Feb.Mar.)	43.0	Ambient Temp.	55	Ambient Temp. (Lake Michigan)	

2.4 Minimum 7-day, 10-year flow: N.A. cfs - MGD.

Indicate source of minimum 7-day, 10-year flow N.A.

2.5 Dilution Ratio: N.A. :

2.6 Stream flow rate at time of sampling N.A. cfs MGD.

3. CHEMICAL CONSTITUENT Existing Permitted Conditions X; Existing conditions ; Proposed Permitted Conditions . Type of sample: grab (time of collection); X composite (number of samples per day 6)
(see instructions for analyses required)

	RAW WASTE (mg/l)	TREATED EFFLUENT* Avg. (mg/l)	TREATED EFFLUENT* Max. (mg/l)	UPSTREAM (mg/l)	DOWNSTREAM SAMPLES (mg/l)
Ammonia Nitrogen (asN)		NTF	NTF		
Arsenic (total)		"	"		
Barium		"	"		
Boron		"	"		
BOD_5		"	"		
Cadmium		"	"		
Carbon Chloroform Extract		"	"		
Chloride		"	"		
Chromium (total hexavalent)		"	"		
Chromium (total trivalent)		"	"		
Copper		"	"		
Cyanide (total)		"	"		
Cyanide (readily released @150°F & pH 4.5)		"	"		
Dissolved Oxygen		"	"		
Fecal Coliform		"	"		

*Flow and chemical constituent concentrations based on operating data for the period Sept. '75 - Aug. '76.

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	RAW WASTE (mg/l)	TREATED EFFLUENT* Avg. (mg/l)	Max.	UPSTREAM (mg/l)	DOWNSTREAM SAMPLES (mg/l)
Fluoride		NTF	NTF		
Hardness (as Ca CO_3)		"	"		
Iron (total)		0.32	0.50		
Lead		NTF	NTF		
Manganese		"	"		
MBAS		"	"		
Mercury		"	"		
Nickel (Total)		0.03	0.07		
Nitrates (asN)		NTF	NTF		
Nitrites (asN)		"	"		
Oil & Grease (hexane solubles or equivalents)		3.6	26***		
Organic Nitrogen (as N)		NTF	NTF		
pH		7.8	8.5		
Phenols		NTF	NTF		
Phosphorous (as P)		"	"		
Radioactivity		"	"		
Selenium		"	"		
Silver		"	"		
Sulfate		"	"		
Suspended Solids		16.4 11.3**	138***		
Total Dissolved Solids		321	733		
Zinc		NTF	NTF		
Others Iron (Dissolved)		0.1	0.38		

* Flow and chemical constituent concentrations based on operating data for the period Sept. '75 - Aug. '76.

** Average of all samples except the max. concentration of 138 mg/l.

*** Maximum values encountered during survey period. Subsequently reported as violations of NPDES Permit and corrected.

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Commonwealth Edison
72 West Adams Street, Chicago, Illinois
Address Reply to: Post Office Box 767
Chicago, Illinois 60690

November 23, 1976

2715-16 (4553-13)

RECEIVED
DEC 01 1976
ENVIRONMENTAL PROTECTION AGENCY
DIV. OF WATER POLLUTION CONTROL
RECORDS UNIT—SPRINGFIELD
STATE OF ILLINOIS

Certified Mail

Permit Section
Division of Water Pollution Control
Illinois Environmental
Protection Agency
2200 Churchill Road
Springfield, Illinois 62706

Re: Renewal of Operating Permit for Water Pollution Control Facilities at Waukegan Station; Permit No. 1974-EB-346-OP

Dear Sir:

Attached for your review and approval are two (2) copies of an application for renewal of the operating permit for the Waukegan Station slag field and ash settling basin. The present permit expires February 28, 1977.

There have been no major operational changes at the station since the last permit application. Therefore, no additional plans and drawings accompany this renewal application. However, a revised Schedule N is attached which reflects settling basin effluent monitoring data for the period September, 1975 thru August, 1976. Those parameters for which values are indicated were chosen due to their inclusion on the NPDES Permit.

In support of this renewal request we call your attention to operating data for the settling basin, which demonstrates the system to be exceptionally reliable and effective. In the past year only on several occasions were NPDES Permit effluent limitations exceeded. In such instances, the non-compliance was quickly investigated and corrected.

If you should have any questions, please call Mr. Jeffrey P. Smith of my staff (312/294-2935).

Sincerely,

John H. Hughes
Director of Water Quality

JHH:JPS:pm
Attachment

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Exhibit

39

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N P D E S
MICROFILM "JACKET" INFORMATION

1. Division Code: W
2. FIPS County Code: 097
3. City/Township Code: 190
4. Governing Body Code: 0500A
5. PERMITTEE NAME (File Subject)
   COMMONWEALTH EDISON-WAUKEGAN 10178
6. File Division: 13
7. NPDES Number: IL0002259

CROSS-REFERENCE INFORMATION

8. Governing Body Name
   COMMONWEALTH EDISON COMPANY
9. F/S/P Code: _____
10. Date Identified In The Name Field Refers To:
    a. Permit Issue Date: 01-20-78
    b. Permit Cancellation Date: __-__-__
    c. No Permit Required Date: __-__-__
11. Permit Expiration Date: 10-01-79

DWPC Records Unit
ADM 1079

COMMONWEALTH EDISTON COMPANY- Waukegan Station
MODIFIED PERMIT
IL 0002259
Issued: 1-20-78
Expires: 10-01-79

R.4

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UNITED STATES
ENVIRONMENTAL PROTECTION AGENCY
REGION V
230 SOUTH DEARBORN ST.
CHICAGO, ILLINOIS 60604

RECEIVED
STATE OF ILLINOIS
JAN 30 1978
Environmental Protection Agency
DWPC, Permit Section
NPDES UNIT

JAN 20 1978

Mr. John Hughes
Director of Water Quality
Commonwealth Edison Company
Post Office Box 767
Chicago, Illinois 60690

Re: Commonwealth Edison Company
Zion Nuclear Generating Station
NPDES Permit No: IL 0002763

Waukegan Generating Station
NPDES Permit No: IL 0002259

Dear Mr. Hughes:

On June 30, 1977, Region V communicated to you its determination pursuant to §316(a) of the Federal Water Pollution Control Act, as amended, to impose alternative thermal limitations in the referenced NPDES permits contingent on the performance of a monitoring program. That program was to be based on a draft report by Spigarelli and Murarka of Argonne National Laboratory entitled "Recommendations for Future Monitoring at Zion, Waukegan and other Lake Michigan Power Plants: A Report to EPA, Region V" (Argonne Report). You commented on the draft Argonne Report on June 15, 1977, and it was subsequently revised in July 1977. A copy of the revision was given to Mr. Jim Rice of Commonwealth Edison who discussed it informally with Mr. Gary Milburn of my staff.

While the 1977 comments and subsequent discussions with Mr. Rice suggest that you are in substantial agreement with the Argonne recommendations, certain differences do exist and are addressed below. These include dissolved oxygen monitoring, frequency of phytoplankton and zooplankton sampling, and egg and larval monitoring frequency. More specific issues within these categories are also discussed.

Concerning the comments at the bottom of page 4 of your letter, EPA cannot be responsible for adoption or endorsement of this program by the Illinois EPA or the U. S. Nuclear Regulatory Commission (NRC). We believe Edison is aware of our recent correspondence with Mr. Edson Case in which we have discussed the proposed lake-wide monitoring program and requested that the NRC review that program and coordinate their Environmental and Technical Specification requirements so that duplicative and wasteful efforts are reduced.

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Edison is aware that Region V fully intends to implement a lake-wide monitoring program and to require other utilities to participate either as a condition of our concurrence in §316(a) determinations, as part of our concurrence in future environmental impact statements in which once-through cooling is proposed, or potentially as part of §316(b) determinations or monitoring requirements. Each additional increment of once-through cooling on the Lake will need to sustain a higher burden of proof. Our predictive capabilities and our understanding of the Lake Michigan ecosystem must be greatly improved if once-through cooling is to be a viable option at all.

Concerning the monitoring categories mentioned earlier we propose the following resolutions where differences with the Argonne Plan were indicated in your June 1977 response:

Table 4: Dissolved Oxygen

Continuous or twice daily measurements of the dissolved oxygen will be required but only for one year. This data will compliment the gas-supersaturation model (table 18, page 2) verifications which you have agreed to perform by providing exposure histories. In addition, the dissolved oxygen measurements will give some indication of the frequency, duration, timing and degree of gas-supersaturation during the year.

Table 11: Phytoplankton and Zooplankton

We propose to adopt the schedule recommended by Commonwealth Edison that is, sampling once a week.

We note that Argonne has changed their recommendation such that increased plankton sampling would have been necessary only if chlorophyll concentrations changed $\geq 15\%$ between successive samples. We are not at this time requiring that Edison adhere to that recommendation. Chlorophyll-a (table 10) and N_2 fixation (table 12) must also be measured once a week. However, Mr. Rice has informally proposed that N_2 fixation only be measured if phytoplankton sampling indicates nitrogen fixers. We believe that the proposal is unacceptable because phytoplankton would not have been analyzed, and if they were, N_2 sample collection would occur sometime after the phytoplankton sampling. Thus, no direct comparison could be made. In further response to your comments on table 12, we are aware that the majority of phytoplankton in the area of Zion and Waukegan are not nitrogen fixing. However, these phytoplankton can be important nuisance organisms, and heat in combination with nutrients is known to stimulate their growth. We believe it important to obtain better understanding of how these organisms are affected, if at all, by condenser passage and thermal stimulation.

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Table 5 - Total Dissolved Solids
Table 6 - Turbidity
Table 7 - Total and Soluble Phosphorus
Table 8 - Soluble Silica
Table 9 - Organic Carbon

Based on the above requirement for phytoplankton-zooplankton sampling the following parameters should be sampled on all plankton sampling and acoustic survey days: total dissolved solids (TDS), turbidity, total phosphorus, soluble phosphorus, soluble silica, and organic carbon.

This requirement is consistent with the Edison recommendations and subsequent discussions with Mr. Rice.

Table 13: Benthos - no disagreement.

Table 14: Acoustic Fish Surveys

The 7 survey periods, 4 consecutive sample days per survey period, recommended by Edison is acceptable, with the understanding that at least 2 nights be sampled as well.

Table 15: Fish-Trawl and Gill Nets

The 7 survey periods, 4 sample days per survey period, recommended by Edison is acceptable.

Table 16: Impingement

The Argonne recommendation was based on a statistical analysis of previous years impingement data and was designed to provide a higher precision estimate of fish impingement losses. For this reason we believe it should be adhered to. Based on the Argonne recommendations, further discussions with Drs. Spigarelli and Murarka, and the Edison recommendations, the following impingement sampling schedule will be required:

> Once per week during the year except 1) during the spring period of peak smelt impingement when ten continuous days shall be sampled; 2) during the period of peak alewife impingement when 30 continuous days shall be sampled to begin at the onset of spring inshore migration [about May 1, for Zion]; 3) during the fall period when peak smelt and alewife impingement occurs, ten continuous days shall be sampled.

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We calculate that approximately 94 days would be sampled annually under this schedule. Under the Edison recommended schedule approximately 104 days would be sampled.

Table 17: Eggs and Larvae

Deletion of sampling for eggs and larvae at the intake as recommended by Edison is not acceptable.

Sampling for eggs and larvae shall be conducted once per week except during periods of peak abundance when sampling shall be every other day.

Table 18: Other Recommendations by Argonne

We will only comment where Edison has expressed a recommendation different than that by Argonne which has not been dealt with above.

P. 3 Concerning Phytoplankton and Zooplankton

EPA will not ask Edison to sponsor a review group.

With respect to measuring length, frequency, sex ratio and fecundity of Mysis and Pontoporeia, these measurements are needed to supply a baseline for macrobenthos population dynamics. Sampling at the intake should not be arduous and is certainly less costly than conducting such sampling in the lake.

P. 4 Fish Monitoring

While we recognize and encouraged the e[illegible]f the Lake Michigan Utility Group in sponsoring the Limnetic [illegible]rt on Lake Michigan Fish Populations, we believe that effort is [illegible]om "complete". We view that work as a building block for future efforts particularly as the data base improves.

Fish sampling with seine nets is a necessity. Without such sampling, there is no way of knowing what is in the nearshore area which often has many species not found offshore.

The revision of the Argonne Report now recommends (p. 26) that simulation modeling be applied to selected species. Edison has not had a chance to comment on this recommendation. While we recognize that modeling has many limitations we believe it offers another useful tool in attempting to assess lakewide impacts. We believe that such a model is necessary in attempting to assess new uses of the Lake. The Lake Michigan Utility Group should be looking carefully at a future effort in that direction. Certain basic data must be available for such a model, and if that data is not available now, then efforts should begin to collect such information.

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Finally, it is not our wish to impose costly non-productive monitoring efforts on the utility industry. We expect to review these efforts at least yearly, and perhaps more often, and to make adjustments if they are needed. Therefore, we will expect you to submit the data at the end of the first year's program. We will analyze the data and notify you as soon as possible of any changes desired. However, you will be expected to continue the program into the next year until you hear otherwise from us.

Enclosed with this letter are modified NPDES permits for Zion and Waukegan Stations reflecting our §316(a) determinations and the conditions thereof. Conducting the program at Zion is a condition of the §316(a) alternative thermal limitations granted for the Zion and Waukegan Stations on June 30, 1977.

If you have any questions, please contact Vacys J. Saulys at 312/353-2098 or Gail C. Ginsberg at 312/353-2094.

Very truly yours,

Dale S. Bryson

Dale S. Bryson, Acting Director
Enforcement Division

Attachments

cc: w/Attachments

Michael Mauzy
Illinois Environmental
Protection Agency

A. Daniel Feldman, Esquire
Isham, Lincoln, & Beale

Thomas Eisele
Lake Michigan Federation

David Comey
Citizens For A Better
Environment

Robert Welford
Bureau of Sport Fisheries
and Wildlife

Edson Case
U.S. Nuclear Regulatory
Commission

Suzanna Carlson
1636 N. Wells - Apt. 709
Chicago, Illinois 60614

Catherine Quigg, President
Pollution & Environmental Problems
Box 309
Palatine, Illinois 60067

James Park
Illinois Environmental
Protection Agency

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Permit No. IL 0002259

Application No. IL 0002259

AUTHORIZATION TO DISCHARGE UNDER THE

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM

In compliance with the provisions of the Federal Water Pollution Control Act, as amended, (33 U.S.C. 1251 et seq; the "Act:),

COMMONWEALTH EDISON COMPANY

is authorized by the United States Environmental Protection Agency, Region V,

to discharge from a facility located at Waukegan Generating Station
Greenwood Ave. and Lake Michigan
Waukegan, Illinois 60085

to receiving waters named Lake Michigan

in accordance with effluent limitations, monitoring requirements and other conditions set forth in Parts I, II, and III hereof.

This permit and the authorization to discharge shall expire at midnight, October 1, 1979 . Permittee shall not discharge after the above date of expiration. In order to receive authorization to discharge beyond the date of expiration, the permittee shall submit such information, forms, and fees as are required by the Agency authorized to issue NPDES permits no later than 180 days prior to the above date of expiration.

This permit, modified in accordance with 40 CFR 125, shall become effective upon this date of signature and supersedes NPDES Permit number IL 0002259 dated November 27, 1974 and modified on December 30, 1976.

Signed this JAN 20 1978

Dale S. Bryson

Acting Director, Enforcement Division

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Permit No. IL 0002259

PART I

AS MODIFIED JAN 20 1978

A. 1. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

Beginning on the effective date of this modification and lasting until July 1, 1977 the permittee is authorized to discharge from outfall(s) serial number(s) 001(a)-Condenser Cooling Water Demineralizer Filter Backwash, Boiler Blowdown and House Service Water
Such discharges shall be limited and monitored by the permittee as specified below:

EFFLUENT CHARACTERISTIC	DISCHARGE LIMITATIONS kg/day (lbs/day)		DISCHARGE LIMITATIONS Other Units (Specify)		MONITORING REQUIREMENTS	
	Daily Avg(1)	Daily Max(1)	Daily Avg(1)	Daily Max(1)	Measurement Frequency	Sample Type
Flow-M^3/Day (MGD)	-	-	-	-	Continuous	-
Temperature c(°F)(2)	-	-	-	-	Continuous	-
Free Chlorine Residual(3)	-	-	0.2 mg/l	0.5 mg/l	Once/7 Days	Grab
Total Chlorine Residual(3)	-	-	-	-	Once /7 Days	Grab
Heat Rejection Rate (BTU/Hr)	-	-	-	-	Monthly Max.	Report
Plant Capacity Factor (%)	-	-	-	-	Monthly Avg.	Report

(1) See Part I-C.4. for definition.
(2) Intake and Discharge temperatures.
(3) See Part III-A.7 for additional chlorine limitations and monitoring requirements. Chlorination period not to exceed a total of 2 hours per day per unit. The frequency and duration of chlorination on a per unit basis shall be reported on the Discharge Monitoring Report.

There shall be no discharge of floating solids or visible foam in other than trace amounts.

Samples taken in compliance with the monitoring requirements specified above shall be taken at the following location(s): At a point representative of the discharge but prior to entry into Lake Michigan.

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Permit No. IL 0002259

PART I

AS MODIFIED JAN 2 9 1978

2. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

Beginning on the effective date of this modification and lasting until July 1, 1977 the permittee is authorized to discharge from outfall(s) serial number(s) 001(b)-Demineralizer Regenerant Waste

Such discharges shall be limited and monitored by the permittee as specified below:

EFFLUENT CHARACTERISTIC	DISCHARGE LIMITATIONS kg/day (lbs/day)		DISCHARGE LIMITATIONS Other Units (Specify)		MONITORING REQUIREMENTS	
	Daily Avg (1)	Daily Max (1)	Daily Avg (1)	Daily Max (1)	Measurement Frequency	Sample Type
Flow-M^3/Day (MGD)	-	-	-	-	When Sampling	-
Dissolved Solids	-	-	-	-	1 Discharge Period Per 7 days	24-Hr. Composite

(1) See Part I-C.4 for definition.

There shall be no discharge of floating solids or visible foam in other than trace amounts.

Samples taken in compliance with the monitoring requirements specified above shall be taken at the following location(s): At a point representative of the discharge but prior to mixing with other waters.

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Permit No. IL 0002259

PART I

AS MODIFIED JAN 2 0 1978

A.3. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

Beginning on the effective date of this modification and lasting until July 1, 1977 the permittee is authorized to discharge from outfall(s) serial number(s) 002 -Ash Pond Overflow

Such discharges shall be limited and monitored by the permittee as specified below:

EFFLUENT CHARACTERISTIC	DISCHARGE LIMITATIONS kg/day (lbs/day) Daily Avg(1)	Daily Max(1)	Other Units (Specify) Daily Avg(1)	Daily Max(1)	MONITORING REQUIREMENTS Measurement Frequency	Sample Type
Flow-M^3/Day (MGD)	-	-	-	-	When Sampling	-
Suspended Solids	-	-	-	-	One Day/7 Days	24 Hr. Composite
Dissolved Solids	-	-	-	-	One Day/7 Days	24 Hr. Composite
Oil and Grease	-	-	-	-	Once/7 Days	Grab
Iron (Total)	-	-	-	2.0 mg/l	One Day/Month	24 Hr. Composite
Iron (Dissolved)	-	-	-	0.5 mg/l	One Day/Month	24 Hr. Composite
Copper (Total)	-	-	-	-	One Day/Month	24 Hr. Composite

(1) See Part I-C.4 for definition.

The pH shall not be less than 6.0 nor greater than 9.0 and shall be monitored by grab sample measured once per 7 days.

There shall be no discharge of floating solids or visible foam in other than trace amounts.

Samples taken in compliance with the monitoring requirements specified above shall be taken at the following location(s): At a point representative of combined discharge at the confluence of the two unnamed ditches in the south-east corner of the facility.

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Permit No. IL 0002259

PART I

AS MODIFIED JAN 2 0 1978

A.4. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

During the period beginning July 1, 1977 and lasting until October 1, 1979
the permittee is authorized to discharge from outfall(s) serial number(s) 001(a)-Condenser Cooling Water and House Service Water

Such discharges shall be limited and monitored by the permittee as specified below:

EFFLUENT CHARACTERISTIC	DISCHARGE LIMITATIONS kg/day (lbs/day) Daily Avg(1)	kg/day (lbs/day) Daily Max(1)	Other Units (Specify) Daily Avg(1)	Other Units (Specify) Daily Max(1)	MONITORING REQUIREMENTS Measurement Frequency	Sample Type
Flow-M³/Day (MGD)	-	-	-	-	Continuous	-
Temperature °C(°F)(2)	-	-	-	-	Continuous	-
Free Chlorine Residual(3)	-	-	-	-	Once/7 Days	Grab
Total Chlorine Residual(3)	-	-	-	-	Once/7 Days	Grab
Heat Rejection Rate (BTU/Hr.)	-	-	-	-	Monthly Max.	Report
Plant Capacity Factor (%)	-	-	-	-	Monthly Avg.	Report

(1) See Part I-C.4 for definition
(2) Intake and Discharge temperatures.
(3) See Part III-A.7 for additional chlorine limitations and monitoring requirements. The frequency and duration of chlorination on a per unit basis shall be reported on the Discharge Monitoring Report.

The pH shall not be less than 6.0 nor greater than 9.0 and shall be monitored by grab sample measured once per 7 days.

There shall be no discharge of floating solids or visible foam in other than trace amounts.

Samples taken in compliance with the monitoring requirements specified above shall be taken at the following location(s): At a point representative of the discharge but prior to entry into Lake Michigan.

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Permit No. IL 0002259

PART I

AS MODIFIED JAN 20 1978

A. 5. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

During the period beginning July 1, 1977 and lasting until October 1, 1979
the permittee is authorized to discharge from outfall(s) serial number(s) 001(b)-Demineralizer Regenerant Waste

Such discharges shall be limited and monitored by the permittee as specified below:

EFFLUENT CHARACTERISTIC	DISCHARGE LIMITATIONS kg/day (lbs/day) Daily Avg(1)	kg/day (lbs/day) Daily Max(1)	Other Units (Specify) Daily Avg(1)	Other Units (Specify) Daily Max(1)	MONITORING REQUIREMENTS Measurement Frequency	Sample Type
Flow-M^3/Day (MGD)	-	-	-	-	When Sampling	-
Suspended Solids	-	-	-	15 mg/l	1 Discharge Period Per 7 Days	Composite @ Half-Hour Intervals
Iron (Total)	-	-	-	2.0 mg/l	One/7 Days	Grab
Copper (Total)	-	-	-	1.0 mg/l	One/7 Days	Grab

(1) See Part I-C.4 for definition.

There shall be no discharge of floating solids or visible foam in other than trace amounts.

Samples taken in compliance with the monitoring requirements specified above shall be taken at the following location(s): At a point representative of the discharge but prior to entry into the discharge flume.

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Permit No. IL 0002258

PART I

AS MODIFIED JAN 2 0 1978

7 EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

During the period beginning July 1, 1977 and lasting until October 1, 1979
the permittee is authorized to discharge from outfall(s) serial number(s) 001(d) -Treated Floor Drain and Roof and Yard Effluents

Such discharges shall be limited and monitored by the permittee as specified below:

EFFLUENT CHARACTERISTIC	DISCHARGE LIMITATIONS kg/day (lbs/day) Daily Avg (2)	kg/day (lbs/day) Daily Max (2)	Other Units (Specify) Daily Avg (2)	Other Units (Specify) Daily Max (2)	MONITORING REQUIREMENTS (2) Measurement Frequency	Sample Type
Flow-MGD/Day (MGD)	-	-	-	-	When Sampling	-
Suspended Solids	-	-	-	15 mg/l	One Day/7 Days	Composite
Oil and Grease	-	-	-	15 mg/l	Once/7 Days	Grab

(1) During periods of discharge.
(2) See Part I-C.4 for definition.

The pH shall not be less than 6.0 nor greater than 9.0 and shall be monitored by grab sample measured once per 7 days.

There shall be no discharge of floating solids or visible foam in other than trace amounts.

Samples taken in compliance with the monitoring requirements specified above shall be taken at the following location(s): At a point representative of the discharge but prior to entry into the discharge flume.

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Permit No. IL 0002259

PART I

AS MODIFIED JAN 2 0 1978

A8. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

During the period beginning July 1, 1977 and lasting until October 1, 1979
the permittee is authorized to discharge from outfall(s) serial number(s) 001(e) - Recirculating Combined Waste Treatment System Blowdown

Such discharges shall be limited and monitored by the permittee as specified below:

EFFLUENT CHARACTERISTIC	DISCHARGE LIMITATIONS kg/day (lbs/day) Daily Avg (2)	Daily Max (2)	Other Units (Specify) Daily Avg (2)	Daily Max (2)	MONITORING REQUIREMENTS (1) Measurement Frequency	Sample Type
Flow-M^3/Day (MGD)	-	-	-	-	When Sampling	-
Suspended Solids	-	-	-	15 mg/l	One Day / 7 Days	24 Hr. Composite
Dissolved Solids	-	-	-	3500 mg/l	One Day / 7 Days	24 Hr. Composite
Oil and Grease	-	-	-	15 mg/l	Once / 7 Days	Grab
Iron (Total)	-	-	-	2.0 mg/l	Once/3 Months	Grab
Iron (Dissolved)	-	-	-	0.5 mg/l	Once/3 Months	Grab

(1) See Part III-A.6.a for special monitoring requirements in the event that metal cleaning wastes are discharged to the recirculating combined waste treatment system.
(2) See Part I-C.4 for definition.

The pH shall not be less than 6.0 nor greater than 9.0 and shall be monitored by grab sample measured once per 7 days.

There shall be no discharge of floating solids or visible foam in other than trace amounts.

Samples taken in compliance with the monitoring requirements specified above shall be taken at the following location(s): At a point representative of the discharge but prior to entry into the discharge flume.

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Permit No. IL 0002259

PART I

AS MODIFIED JAN 2 0 1978

A.9 EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

During the period beginning July 1, 1977 and lasting until October 1, 1979
the permittee is authorized to discharge from outfall(s) serial number(s) 002 - Coal Pile Runoff Collection Basin Discharge

Such discharges shall be limited and monitored by the permittee as specified below:

EFFLUENT CHARACTERISTIC	DISCHARGE LIMITATIONS kg/day (lbs/day) Daily Avg.(2)	kg/day (lbs/day) Daily Max(2)	Other Units (Specify) Daily Avg(2)	Other Units (Specify) Daily Max(2)	MONITORING REQUIREMENTS(1) Measurement Frequency	Sample Type
Flow-M^3/Day (MGD)	-	-	-	-	When Sampling 1 Discharge Period per 7 Days	-
Suspended Solids	-	-	-	15 mg/l		Composite
Oil and Grease	-	-	-	15 mg/l	Once / 7 Days	Grab

(1) During periods of discharge
(2) See Part I-C.4 for definition

The pH shall not be less than 6.0 nor greater than 9.0 and shall be monitored by grab sample measured once per 7 days.

There shall be no discharge of floating solids or visible foam in other than trace amounts.

Samples taken in compliance with the monitoring requirements specified above shall be taken at the following location(s): At a point representative of the discharge but prior to entry into Lake Michigan.

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AS MODIFIED JAN 20 1978

B. SCHEDULE OF COMPLIANCE

1. The permittee shall achieve compliance with the effluent limitations specified for discharges in accordance with the following schedule:

   a. Neutralization, Recirculating Combined, Metal Cleaning, Combined Bilge and Drain, and Coal Pile Runoff Waste Treatment Systems
      (1) Preliminary Plans Submitted by May 1, 1976 *
      (2) Construction Progress Report by December 31, 1976
      (3) Attainment of Operational Level by July 1, 1977

   b. Chlorine Application Point Relocation Project Operational by January 31, 1977

*Completed

2. No later than 14 calendar days following a date identified in the above schedule of compliance, the permittee shall submit either a report of progress or, in the case of specific actions being required by identified dates, a written notice of compliance or noncompliance. In the latter case, the notice shall include the cause of non-compliance, any remedial actions taken, and the probability of meeting the next scheduled requirements.

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AS MODIFIED JAN 2 0 1978

C. MONITORING AND REPORTING

1. Representative Sampling - Samples and measurements taken as required herein shall be representative of the volume and nature of the monitored discharge.

2. Reporting - The permittee shall record monitoring results on Discharge Monitoring Report forms, using one such form for each discharge each month. The completed monthly forms shall be retained by permittee for a period of three months beginning with each calendar quarter, and the forms from those three months shall be mailed to USEPA no later than the 28th day of the following month; i.e. (a) January, February, March (submit April 28); (b) April, May, June (submit July 28); (c) July, August, September (submit October 28); October, November, December (submit January 28).

The permittee shall retain a copy of all reports submitted. All reports shall be submitted to:

U.S. Environmental Protection Agency
Attention: Chief, Compliance Unit
230 South Dearborn Street
Chicago, Illinois 60604

The permittee shall submit these monitoring reports each month to the State Agency by the 15th day of the following month at the following address:

Manager
Illinois EPA-DWPC Region 2C
1701 First Avenue
Maywood, Illinois 60153

3. Noncompliance Notification - If, for any reason, the permittee does not comply with or will be unable to comply with any daily maximum effluent limitation specified in this permit, the permittee shall provide the Regional Administrator and the State with the

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AS MODIFIED

JUN 2 0 1979

following information, in writing within five (5) days of becoming aware of such condition: (a) a description of the discharge; (b) cause of noncompliance; (c) the period of noncompliance, including exact dates and times; (d) if not corrected, the anticipated time the noncompliance is expected to continue, and (e) steps being taken to reduce, eliminate and prevent recurrence of the noncomplying discharge.

4. Definitions

a. "Daily Average" Discharge

1. Weight Basis - The "daily average" discharge means the total discharge by weight during a calendar month divided by the number of days in the month that the production or commercial facility was operating. Where less than daily sampling is required by this permit, the daily average discharge shall be determined by the summation of the measured daily discharge by weight divided by the number of days during the calendar month when the measurements were made.

2. Concentration Basis - The "daily average" concentration means the arithmetic average (weighted by flow value) of all the daily determinations of concentration made during a calendar month. Daily determinations of concentration made using a composite sample shall be the concentration of the composite sample. When grab samples are used, the daily determination of concentration shall be the arithmetic average (weighted by flow value) of all the samples collected during the calendar day.

b. "Daily Maximum" Discharge

1. Weight Basis - The "daily maximum" discharge means the total discharge by weight during any calendar day.

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2. Concentration Basis - The "daily maximum" concentration means the daily determination of concentration for any calendar day.

5. Test Procedures - Test procedures for the analysis of pollutants shall conform to regulations published pursuant to Section 304(g) of the Act, under which such procedures may be required.

6. Recording of Results - For each measurement or sample pursuant to the requirements of this permit the permittee shall record the following information: (a) the exact place, date, and time of sampling; (b) the dates the analyses were performed; (c) the person(s) who performed the analyses; (d) the analytical techniques or methods used; and (e) the results of all required analyses.

7. Additional Monitoring by Permittee - If the permittee monitors any pollutant at the location(s) designated herein more frequently than required by this permit, using approved analytical methods as specified above, the results of such monitoring shall be included in the calculation and reporting of the values required in the Discharge Monitoring Report Form (EPA No. 3320-1). Such increased frequency shall also be indicated.

8. Records Retention - All records and information resulting from the monitoring activities required by this permit including all records of analyses performed and calibration and maintenance of instrumentation and recordings from continuous monitoring instrumentation shall be retained for a minimum of three (3) years, or longer if requested by the Regional Administrator or the State Water Pollution Control Agency.

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PART II

A. MANAGEMENT REQUIREMENTS

1. Change in Discharge - All discharges authorized herein shall be consistent with the terms and conditions of this permit. The discharge of any pollutant identified in this permit more frequently than or at a level in excess of that authorized shall constitute a violation of the permit. Any anticipated facility expansions, production increases, or process modifications which will result in new, different, or increased discharges of pollutants must be reported by submission of a new NPDES application or, if such changes will not violate the effluent limitations specified in this permit, by notice to the permit issuing authority of such changes. Following such notice, the permit may be modified to specify and limit any pollutants not previously limited.

2. Facilities Operation - The permittee shall at all times maintain in good working order and operate as efficienty as possible all treatment or control facilities or systems installed or used by the permittee to achieve compliance with the terms and conditions of this permit.

3. Adverse Impact - The permittee shall take all reasonable steps to minimize any adverse impact to navigable waters resulting from noncompliance with any effluent limitations specified in this permit, including such accelerated or additional monitoring as necessary to determine the nature and impact of the noncomplying discharge.

4. Bypassing - Any diversion from or bypass of facilities necessary to maintain compliance with the terms and conditions of this permit is prohibited, except (i) where unavoidable to prevent loss of life or severe property

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damage, or (ii) where excessive storm drainage or runoff would damage any facilities necessary for compliance with the effluent limitations and prohibitions of this permit. The permittee shall promptly notify the Regional Administrator and the State in writing of each such diversion or bypass.

5. Removed Substances - Solids, sludges, filter backwasn, or other pollutants removed from or resulting from treatment or control of wastewaters shall be disposed of in a manner such as to prevent any pollutant from such materials from entering navigable waters.

6. Power Failures - In order to maintain compliance with the effluent limitations and prohibitions of this permit, the permittee shall either: (a) in accordance with the Schedule of Compliance contained in Part I, provide an alternative power source sufficient to operate the wastewater control facilities; or, if no date implementation appears in Part I, (b) halt, reduce or otherwise control production and/or all discharges upon the reduction, loss, or failure of one or more of the primary sources of power to the wastewater control facilities.

B. RESPONSIBILITIES

1. Right of Entry - The permittee shall allow the head of the State Water Pollution Control Agency, the Regional Administrator, and/or their authorized representatives, upon the presentation of credentials: (a) to enter upon the permittee's premises where an effluent source is located or in which any records are required to be kept under the terms and conditions of this permit; and (b) at reasonable times to have access to and copy any records required to be kept under the terms and conditions of this permit; to inspect any monitoring equipment or monitoring method required in this permit; and to sample any discharge of pollutants.

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2. Transfer of Ownership or Control - In the event of any changes in control or ownership of facilities from which the authorized discharges emanate, the permittee shall notify the succeeding owner or controller of the existence of this permit by letter, a copy of which shall be forwarded to the Regional Administrator and the State Water Pollution Control Agency.

3. Availability of Reports - Except for data determined to be confidential under Section 308 of the Act, all reports prepared in accordance with the terms of this permit shall be available for public inspection at the offices of the State Water Pollution Control Agency and the Regional Administrator. As required by the Act, effluent data shall not be considered confidential. Knowingly making any false statement on any such report may result in the imposition of criminal penalties as provided for in Section 308 of the Act.

4. Permit Modification - After notice and opportunity for a hearing, this permit may be modified, suspended, or revoked in whole or in part during its term for cause including, but not limited to, the following: (a) violation of any terms or conditions of this permit; (b) obtaining this permit by misrepresentation or failure to disclose fully all relevant facts; or (c) a change in any condition that requires either a temporary or permanent reduction or elimination of the authorized discharge.

5. Toxic Pollutants - Notwithstanding Part II, B-4 above, if a toxic effluent standard or prohibition (including any schedule of compliance specified in such effluent standard or prohibition) is established under Section 307(a) of the Act for a toxic [illegible]ant which is present in the discharge and such stand[illegible]hibition is more stringent than any limitati[illegible]ollutant in this permit, this permit shall be rev[illegible]ied in accordance with the toxic effluent sta[illegible]r [illegible]ibition and the permittee is notified.

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6. Civil and Criminal Liability - Except as provided in permit conditions on "Bypassing" (Part II, A-4) and "Power Failure" (Part II, A-6), nothing in this permit shall be construed to relieve the permittee from civil or criminal penalties for noncompliance.

7. Oil and Hazardous Substance Liability - Nothing in this permit shall be construed to preclude the institution of any legal action or relieve the permittee from any responsibilities, liabilities, or penalties to which the permittee is or may be subject under Section 311 of the Act.

8. State Law - Nothing in this permit shall be construed to preclude the institution of any legal action or relieve the permittee from any responsibilities, liabilities, or penalties established pursuant to any applicable State law or regulation under authority preserved by Section 510 of the Act.

9. Property Rights - The issuance of this permit does not convey any property rights in either real or personal property, or any exclusive privileges, nor does it authorize any injury to private property or any invasion of personal rights, nor any infringement of Federal, State or local laws or regulations.

10. Severability - The provisions of this permit are severable, and if any provision of this permit or the application of any provision of this permit to any circumstance, is held invalid, the application of such provision to other circumstances, and the remainder of this permit, shall not be affected thereby.

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Part III

A. Other Requirements

1. Provisions for Change of Monitoring Frequency

If the permittee after monitoring for at least six (6) months determines that he is consistently meeting the effluent limits contained herein, the permittee may request the Regional Administrator and the Director that the monitoring requirements be reduced to twice monthly, monthly or be eliminated. Upon written notification by the Regional Administrator and the Director, the Permittee will monitor as directed.

2. Additional State Requirements

This permit incorporates all applicable provisions of the Illinois Environmental Protection Act and of the Rules and Regulations of Illinois Pollution Control Board, as if they were set forth herein. All such provisions shall become conditions of this Federal NPDES permit as provided by Section 401(d) of the Federal Water Pollution Control Act Amendments of 1972.

3. Prohibited Discharges

a. This permit is specifically for the listed pollutants to be discharged from the designated outfalls only. Discharge of pollutants from an undesignated outfall is not permitted.

b. There shall be no discharge of debris from intake screen washing operations.

c. There shall be no discharge of polychlorinated biphenyl compounds.

d. There shall be no discharge of water side boiler cleaning wastes.

4. Intake Monitoring Requirements

The final report of the intake monitoring program submitted by the permittee on July 9, 1976 is being evaluated with regard to Section

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316(b) of the Act. The Regional Administrator and the Director, after evaluation of the report, may modify the permit in accordance with Part II-B.4 to establish an implementation schedule to insure compliance with Section 316(b).

5. Thermal Discharge Limitations

During the period beginning July 1, 1977 and lasting until October 1, 1979 the permittee is authorized to discharge heated effluent from outfall serial number 001.

Such discharges shall be limited and monitored by the permittee as specified below:

1. The discharge of heat shall be restricted to that associated with generation of 1016 MWe of electric power with the generating equipment on-site as of July 1, 1977.

2. The company shall perform studies pursuant to the conditions specified in NPDES Permit No. IL 0002763 for the Zion Generating Station as a condition of alternative effluent limitations pursuant to Section 316(a) of the Act.

6. Miscellaneous Wastes

a. After July 1, 1977, discharge of metal cleaning wastes shall be directed to the recirculating combined waste treatment system. Recirculating combined waste treatment system blowdown sampling will be performed for one day prior to discharge of these wastes into the treatment system and for three days thereafter as follows:

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Parameter	Daily Max (1)	Measurement Frequency	Sample Type
Flow	-	Continuous	-
Suspended Solids	15 mg/l	Daily	24-Hr. Composite @ Half-Hour Intervals
Dissolved Solids	3500 mg/l	Daily	24-Hr. Composite @ Half-Hour Intervals
Oil and Grease	15 mg/l	Daily	Grab
Copper (Total)	1.0 mg/l	Daily	24-Hr. Composite @ Half-Hour Intervals
Iron (Total)	2.0 mg/l	Daily	24-Hr. Composite @ Half-Hour Intervals
Zinc (Total)	1.0 mg/l	Daily	24-Hr. Composite @ Half-Hour Intervals
Chromium (Total) Hexavalent	0.3 mg/l	Daily	24-Hr. Composite @ Half-Hour Intervals
Alkalinity (Total)	-	Daily	Grab
Chromium Trivalent (Total)	1.0 mg/l	Daily	24-Hr. Composite @ Half-Hour Intervals

The pH shall not be less than 6.0 nor greater than 9.0 and shall be monitored by daily grab samples.

The results of this sampling shall be reported together with the volume of the metal cleaning wastes pursuant to the reporting requirements of Part I-C.2 of this permit.

b. After July 1, 1977 liquid discharges from miscellaneous waste collection sumps, yard drains, and excess run-off from coal storage areas shall be diverted to existing ash settling basins or comparable settling facilities for treatment prior to discharge.

(1) See Part I-C.4 for definition.

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7. Chlorine Limitations And Monitoring

a. From the effective date of this permit until July 1, 1977 the permittee is limited to a free chlorine residual of 0.2 mg/l daily average and 0.5 mg/l daily maximum with the discharge of chlorine not to exceed two hours per day per unit.

b. Daily average shall be defined as the arithmetic average of the chlorine concentrations obtained using the procedure set forth in Exhibit A of the Chlorine Stipulation executed by Commonwealth Edison Company and Region V, U.S. Environmental Protection Agency on April 2, 1976.

c. The daily maximum for total residual chlorine shall be defined as the average of two highest instantaneous chlorine concentrations obtained using the procedures set forth in Exhibit A of the Chlorine Stipulation executed by Commonwealth Edison Company and Region V, U.S. Environmental Protection Agency on April 2, 1976 for each chlorination period. This definition shall also apply to daily maximum free residual chlorine until July 1, 1977. After July 1, 1977 the daily maximum for free residual chlorine shall be the single highest chlorine concentration obtained using the procedures set forth in Exhibit A of the Chlorine Stipulation executed by Commonwealth Edison Company and Region V, U.S. Environmental Protection Agency on April 2, 1976 for each chlorination period.

d. The monitoring location for chlorine residual shall be as referenced in Exhibit C-2 of the Chlorine Stipulation executed by Commonwealth Edison Company and Region V, U.S. Environmental Protection Agency on April 2, 1976.

e. The Chlorine Stipulation executed by Commonwealth Edison Company and Region V, U.S. Environmental Protection Agency, on April 2, 1976 is incorporated by reference into this permit as though fully set forth herein.

B. Modification Provision

JAN 20 1978

NPDES Permit No. IL 0002259, as modified on containing herein all modifications supersedes, for all purposes on and after the date of modification, the original permit issued and dated November 29, 1974, and modified December 30, 1976. However, this modification is not in derogation of any action heretofore taken under the original permit issued and dated November 27, 1974, and modified December 30, 1976, nor does this modification relieve the permittee of any liability for violation of any provision of the original permit issued and dated November 27, 1974, and modified December 30, 1976, committed prior to the effective date of this modification.

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Exhibit

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W0971900500A COM ED-WAUK ITP MOD [S] 03 1986EN1415 1

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PERMIT/PLAN/SPECIFICATION
MICROFILM JACKET INFORMATION

1.	DIVISION CODE	W
2.	FIPS COUNTY CODE	097
3.	CITY/TOWNSHIP CODE	190
4.	GOVERNING BODY CODE	0500A
5.	PERMITTEE NAME (FILE SUBJECT) COM ED-WAUK ITP MOD	
6.	FILE DIVISION	03
7.	IEPA PERMIT NUMBER	1986EN1415

CROSS REFERANCE INFORMATION

8.	GOVERNING BODY NAME COMMONWEALTH EDISON COMPANY	
9.	F/S/P/ CODE	B0133A
10.	NPDES NUMBER	IL0002259

1986EN1415

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ILLINOIS ENVIRONMENTAL PROTECTION AGENCY
WATER POLLUTION CONTROL PERMIT

PERMIT NO.: 1986-EN-1415 DATE ISSUED: September 26, 1986

FINAL PLANS, SPECIFICATIONS, APPLICATION AND SUPPORTING DOCUMENTS PREPARED BY: Commonwealth Edison Company

LOG NUMBERS: 1415-86

SUBJECT: COMMONWEALTH EDISON COMPANY, WAUKEGAN GENERATING STATION -- Modification of Wastewater Treatment Systems

PERMITTEE TO CONSTRUCT
Commonwealth Edison Company
Post Office Box 767
Chicago, Illinois 60690

Permit is hereby granted to the above designated permittee to construct water pollution control facilities described as follows:

Modification of existing wastewater treatment systems by blocking off the existing outfall ditch for the West Yard Runoff Collection Basin (002) after its confluence with the abandoned coal pile runoff outfall ditch. A two foot hole will be cut in the bottom of the overflow pipe in the coal pile runoff basin and the operating level of the coal pile runoff basin will be lowered. This will allow any water discharged by the West Area Runoff Collection Basin to flow by gravity via the abandoned coal pile runoff outfall ditch into the Coal Pile Runoff Basin, from whence it will be pumped to the existing ash ponds. Ash pond operations will be modified so only one ash pond will be in service at a time. The existing ash pond overflows (003 and 004) will be eliminated by diverting any operating ash pond overflows to the out-of-service ash pond.

This Permit is issued subject to the following Special Condition(s). If such Special Condition(s) requir(s) additional or revised facilities, satisfactory engineering plan documents must be submitted to this Agency for review and approval for issuance of a Supplemental Permit.

SPECIAL CONDITION 1: Operation of the subject facilities shall be governed by NPDES Permit No. IL0002259.

THE STANDARD CONDITIONS OF ISSUANCE INDICATED ON THE REVERSE SIDE MUST BE COMPLIED WITH IN FULL. READ ALL CONDITIONS CAREFULLY.

TGM:GC:rd0021g/74
cc: EPA - Maywood Regional Office
Records Unit
Permit Section

DIVISION OF WATER POLLUTION CONTROL

Thomas G. McSwiggin, P.E.
Manager, Permit Section

IL 532-0008
WPC 155 (Rev. 2/82)

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READ ALL CONDITIONS CAREFULLY:
STANDARD CONDITIONS

The Illinois Environmental Protection Act (Illinois Revised Statutes, Chapter 111-1/2, Section 1039) grants the Environmental Protection Agency authority to impose conditions on permits which it issues.

1. Unless the construction for which this permit is issued has been completed, this permit will expire (1) two years after the date of issuance for permits to construct sewers or wastewater sources or (2) three years after the date of issuance for permits to construct treatment works or pretreatment works.

2. The construction or development of facilities covered by this permit shall be done in compliance with applicable provisions of Federal laws and regulations, the Illinois Environmental Protection Act, and Rules and Regulations adopted by the Illinois Pollution Control Board.

3. There shall be no deviations from the approved plans and specifications unless a written request for modification of the project, along with plans and specifications as required, shall have been submitted to the Agency and a supplemental written permit issued.

4. The permittee shall allow any agent duly authorized by the Agency upon the presentation of credentials:

   a. to enter at reasonable times, the permittee's premises where actual or potential effluent, emission or noise sources are located or where any activity is to be conducted pursuant to this permit.

   b. to have access to and copy at reasonable times any records required to be kept under the terms and conditions of this permit.

   c. to inspect at reasonable times, including during any hours of operation of equipment constructed or operated under this permit, such equipment or monitoring methodology or equipment required to be kept, used, operated, calibrated and maintained under this permit.

   d. to obtain and remove at reasonable times samples of any discharge or emission of pollutants.

   e. to enter at reasonable times and utilize any photographic, recording, testing, monitoring or other equipment for the purpose of preserving, testing, monitoring, or recording any activity, discharge, or emission authorized by this permit.

5. The issuance of this permit:

   a. shall not be considered as in any manner affecting the title of the premises upon which the permitted facilities are to be located;

   b. does not release the permittee from any liability for damage to person or property caused by or resulting from the construction, maintenance, or operation of the proposed facilities;

   c. does not release the permittee from compliance with other applicable statutes and regulations of the United States, of the State of Illinois, or with applicable local laws, ordinances and regulations;

   d. does not take into consideration or attest to the structural stability of any units or parts of the project;

   e. in no manner implies or suggests that the Agency (or its officers, agents or employees) assumes any liability, directly or indirectly, for any loss due to damage, installation, maintenance, or operation of the proposed equipment or facility.

6. Unless a joint construction/operation permit has been issued, a permit for operating shall be obtained from the Agency before the facility or equipment covered by this permit is placed into operation.

7. These standard conditions shall prevail unless modified by special conditions.

8. The Agency may file a complaint with the Board for suspension or revocation of a permit:

   a. upon discovery that the permit application contained misrepresentations, misinformation or false statements or that all relevant facts were not disclosed; or

   b. upon finding that any standard or special conditions have been violated; or

   c. upon any violation of the Environmental Protection Act or any Rule or Regulation effective thereunder as a result of the construction or development authorized by this permit.

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IL 532-0357
ADM 39
054-002

Subject Commonwealth Edison Company
Data Waukegan Generating Station
Reviewed by GC Date

Receiving Date: 9-12-86 Application for state construction permit to modify a treatment works and application for modification of NPDES Permit IL 0002259

Permittee: Commonwealth Edison Company
2 North LaSalle
Post Office Box 767
Chicago, Illinois 60690

Facility: Waukegan Generating Station
10 Greenwood Avenue
Waukegan, Illinois 60087

Permit: IL 0002259 Issued 9-30-85
Expires 8-1-90

Const. pmt prior to 1977 (not in paper file)
new const. pmt. required

Proposal

1. Eliminate outfall 002 South Ditch
receiving stream: Lake Michigan

a) The elimination of outfall 002 will result in: the "West Yard Runoff Collection Basin" effluent will be routed from the south ditch to the coal pile runoff basin.

b) The east and west ash ponds (10 acres each) have overflow outfalls to the south ditch. By operating only one ash pond at a time the dewatered ash pond can be used for emergency overflow from the operating ash pond. Overflows from the ash pond to the south ditch will then be eliminated #'s 003 and 004.

c) Blowdown from the ash ponds (which is a recycle system) is discharged to the WWTP.

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STATE OF ILLINOIS
ENVIRONMENTAL PROTECTION AGENCY

IL 532-0357
ADM 39
054-002

Subject Commonwealth Edison Company
D Waukegan Generating Station
Re wed by [illegible] Date

Influent to the wastewater treatment plant may be increased during wet weather flows. The influent waste streams to the WWTP will have to be modified in the NPDES Permit.

2. Request to modify NPDES Permit to reduce monitoring of outfall 001(c) when receiving non-chemical metal cleaning wastes. If metal cleaning waste is sent directly to 001c then monitoring daily for BPT and BAT parameters will apply. If non-chemical metal cleaning waste is sent to the ash ponds then only iron and copper monitoring daily is required and the conventional pollutants sampling remains at 1/week. 9-19-86 Tel. conv. - MCW goes only to ashponds. - then blowdown through WWTP (OK)

Design: West Yard Runoff Collection Basin
Flow: 0.10 DAF
0.864 max. 1.6 MGD = 10yr 24hr.
DMR's - no flow in past year

Capacity: 1 MG

Coal Pile Runoff : sim
* Flow: 102 gpm 10yr 24hr

* Capacity: approx 1.5 MG

Sumps 2 @ 500 gpm each = 1.4 MGD

Ash Ponds (East and West)
Flow: 5 MGD throughput
recycle system with blowdown
through WWTP
Capacity: 200 ac Ft ea (10 acres ea)

WWTP DMR 7.206 MGD (2.74 MGD per clarifier)
Max Flow from DMR's 5.67 MGD

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STATE OF ILLINOIS
ENVIRONMENTAL PROTECTION AGENCY

IL 532-0357
ADM 39
054-002

Subject Commonwealth Edison Company
Data Waukegan Generating Station
Reviewed by GC Date

Proposed operation should not result in additional blowdown via WWTP if make up water to the ash pond system is controlled. Proposed additional input of 0.8 MGD from the west yard runoff basin can be handled by 200 ac Ft operating ash pond and 200 ac Ft stand by ash pond. The WWTP with a DMF 7.2 MGD can handle the additional input if needed. At the 10yr 24 hr event 1.6 MGD from the west yard basin plus 1.08 MGD from the coal pile requires 0.2 MG storage capacity in coal pile basin plus west yard basin (OK)

Elevations: coal pile runoff basin 580.564 msl.
sumps 578.0 msl.
influent from coal pile 584.564 msl.
influent from west basin 585.564 msl.

Action ⇒ Modify NPDES Permit
1. eliminate outfalls 002, 003, 004
2. modify contributary waste streams to 001c
3. delete daily monitoring of conventional pollutants for 001c

Issue Construction Permit
1. block off south dtch
2. reroute west basin to coal pile

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This Agency is authorized to require this information under Illinois Revised Statutes, 1979, Chapter 111 1-2, Section 1039. Disclosure of this information is required under Section. Failure to do so may prevent this form from being processed and could result in your application being denied. This form has been approved by the Forms Management Center.

IEPA USE:
LOG NO. 1415-86
DATE RECEIVED: RECEIVED

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Environmental Protection Agency
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ILLINOIS ENVIRONMENTAL PROTECTION AGENCY
DIVISION OF WATER POLLUTION CONTROL
PERMIT SECTION
Springfield, Illinois 62706

APPLICATION FOR PERMIT OR CONSTRUCTION APPROVAL

WPC-PS-1

1. **NAME AND LOCATION:**

Name of project: Rerouting Treatment System Discharges at Commonwealth Edison - Waukegan Generating Station

Municipality or Township: Waukegan County: Lake

2. **BRIEF DESCRIPTION OF PROJECT:** Routing of West Basin Discharge to Coal Pile Runoff Basin and Routing of Ash Pond Overflow to Alternate Ash Pond

3. **DOCUMENTS BEING SUBMITTED:** If the project involves any of the items listed below, submit the corresponding schedule, and check the appropriate spaces.

PROJECT

Private Sewer Connection	A	Spray Irrigation	H
Public Sewer Extension	B	Septic Tanks	I
Sewer Extension Construct Only	C	Industrial Treatment or Pretreatment	J X
Sewage Treatment Works	D		
Excess Flow Treatment	E	Cyanide Acceptance	L
Lift Station/Force Main	F	Updating Cyanide Acceptance Form	M
Sludge Disposal	G	Waste Characteristics	N

LAND TRUST: Is the project identified in item number 1 herein, for which a permit is requested, to be constructed on land which is the subject of a trust? ☐ Yes ☐ No
If yes, item number 6.1.1 herein must be signed by a beneficiary, trustee or trust officer, and a trust disclosure must be submitted (see instructions, item 3).

Plans: Title _____ Number of Pages: _____

Specifications: Title _____ Number of Books/Pages: _____

Other Documents (Please Specify) See Accompanying Narrative and Drawings

4. **THIS IS AN APPLICATION FOR (CHECK):**

X A. Joint Construction And Operating Permit
X B. Authorization To Construct (See Instructions) NPDES Permit No. IL00 02259 Issue Date Sept. 30, 1985
C. Construct Only Permit (Does Not Include Operations)
D. Operate Only Permit (Does Not Include Construction)

5. **CERTIFICATIONS AND APPROVAL:**

5.1 **Certificate by Design Engineer**
I hereby certify that I am familiar with the information contained in this application, including the attached schedules indicated above, and that to the best of my knowledge and belief such information is true, complete and accurate. The plans and specifications (specifications other than Standard Specifications for local specifications on file with this Agency) as described above were prepared by me or under my direction.

ENGINEER James C. Hennigan 062-025580 _____
NAME REGISTRATION NUMBER SEAL

FIRM: Commonwealth Edison

ADDRESS: P.O. Box 767
Chicago, Illinois 60690 PHONE NUMBER: (312) 294-4433

SIGNATURE James C. Hennigan

6. **CERTIFICATIONS AND APPROVALS FOR PERMITS:**

6.1 **Certificate by Applicant(s)**
I/We hereby certify that I/we have read and thoroughly understand the conditions and requirements of this Application, and am/are authorized to sign this application in accordance with the Rules and Regulations of the Illinois Pollution Control Board.
I/We hereby agree to conform with the Standard Conditions and with any other Special Conditions made part of this Permit.

6.1.1 NAME OF APPLICANT FOR PERMIT OR AUTHORIZATION TO CONSTRUCT Commonwealth Edison

P.O. Box 767	Chicago	IL	60690
STREET	CITY	STATE	ZIP CODE

SIGNATURE [signature]

TITLE Vice President ORGANIZATION Commonwealth Edison

IL 532-0010

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6.1.2 NAME OF APPLICANT FOR PERMIT TO OWN AND OPERATE Commonwealth Edison

P.O. Box 767	Chicago	Illinois	60690
STREET	CITY	STATE	ZIP CODE

SIGNATURE

TITLE Vice President

6.2 Attested (Units of Government)

DATE _____ SIGNATURE _____ TITLE _____
(CITY CLERK, VILLAGE CLERK, SANITARY DISTRICT CLERK, ETC.)

6.3 Applications from non-governmental applicants which are not signed by the owner, must be signed by a principal executive officer of at least the level of vice president, or his duly authorized representative.

6.4 CERTIFICATE BY INTERMEDIATE SEWER OWNER

I hereby certify that (Please check one):

_____ 1. The sewers to which this project will be tributary have adequate reserve capacity to transport the wastewater that will be added by this project without causing a violation of the Environmental Protection Act or Subtitle C, Chapter I, or

_____ 2. The Illinois Pollution Control Board, in PCB _____ dated _____ granted a variance from Subtitle C, Chapter I to allow construction and operation of the facilities that are the subject of this application.

Name and location of sewer system to which this project will be tributary:

SEWER SYSTEM OWNER _____

STREET	CITY	STATE	ZIP CODE

SIGNATURE _____ DATE _____ TITLE _____

6.4.1 ADDITIONAL CERTIFICATE BY INTERMEDIATE SEWER OWNER

I hereby certify that (Please check one):

_____ 1. The sewers to which this project will be tributary have adequate reserve capacity to transport the wastewater that will be added by this project without causing a violation of the Environmental Protection Act or Subtitle C, Chapter I, or

_____ 2. The Illinois Pollution Control Board, in PCB _____ dated _____ granted a variance from Subtitle C, Chapter I to allow construction and operation of the facilities that are the subject of this application.

Name and location of sewer system to which this project will be tributary:

SEWER SYSTEM OWNER _____

STREET	CITY	STATE	ZIP CODE

SIGNATURE _____ DATE _____ TITLE _____

6.5 CERTIFICATE BY WASTE TREATMENT WORKS OWNER

I hereby certify that (Please check one):

_____ 1. The waste treatment plant to which this project will be tributary has adequate reserve capacity to treat the wastewater that will be added by this project without causing a violation of the Environmental Protection Act or Subtitle C, Chapter I, or

_____ 2. The Illinois Pollution Control Board, in PCB _____ dated _____ granted a variance from Subtitle C, Chapter I to allow construction and operation of the facilities that are the subject of this application.

I also certify that the industrial waste discharges described in the application is capable of being treated by the treatment works, and such waste discharges will be in compliance with all currently applicable local, state or federal pretreatment requirements.

Name and location of waste treatment works to which this project will be tributary:

TREATMENT WORKS OWNER _____

STREET	CITY	STATE	ZIP CODE

SIGNATURE _____ DATE _____ TITLE _____

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ILLINOIS ENVIRONMENTAL PROTECTION AGENCY
DIVISION OF WATER POLLUTION CONTROL
PERMIT SECTION
Springfield, Illinois 62706

SCHEDULE J INDUSTRIAL TREATMENT WORKS CONSTRUCTION OR PRETREATMENT WORKS

1. NAME AND LOCATION:

1.1 Name of project: Rerouting of Treatment System Discharge at Commonwealth Edison Waukegan Station

1.2 Plant Location

1.2.1 NE (Quarter Section) 15 (Section) 45N (Township) 12E (Range) 3 (P.M.)

1.2.2 Latitude 42° 23' 00" North
Longitude 87° 48' 30" West

1.2.3 Name of USGS Quadrangle Map (7.5 or 15 Minutes): Zion (7.5 Min.)

2. NARRATIVE DESCRIPTION AND SCHEMATIC WASTE FLOW DIAGRAM: (see instructions)

See Attachment

2.1 PRINCIPAL PRODUCTS: Electricity

2.2 PRINCIPAL RAW MATERIALS: Coal

3. DESCRIPTION OF TREATMENT FACILITIES:

3.1 Submit a flow diagram through all treatment units showing size, volumes, detention times, organic loadings, surface settling rate, weir overflow rate, and other pertinent design data. Include hydraulic profiles and description of monitoring systems.

3.2 Waste Treatment Works is: Batch____, Continuous X; No. of Batches/day____, No. of Shifts/day____

3.3 Submit plans and specifications for proposed construction.

3.4 Discharge is: Existing X; Will begin on_____.

4. DIRECT DISCHARGE IS TO: Receiving Stream_____ Municipal Sanitary Sewer_____, Municipal storm or municipal combined sewer_____. If receiving stream or storm sewer indicated complete the following:

Name of receiving stream Lake Michigan; tributary to_____;

tributary to_____; tributary to_____.

5. Is the treatment works subject to flooding? If so, what is the maximum flood elevation of record (in reference to the treatment works datum) and what provisions have been made to eliminate the flooding hazard? No

6. APPROXIMATE TIME SCHEDULE: Estimated construction schedule:

Start of Construction As soon as permit is issued Date of Completion 1 month after issue

Operation Schedule_____; Date Operation Begins_____

100% design load to be reached by year_____.

This Agency is authorized to require this information under Illinois Revised Statutes, 1979, Chapter 111 1/2, Section 1039. Disclosure of this information is required under that Section. Failure to do so may prevent this form from being processed and could result in your application being denied. This form has been approved by the Forms Management Center.

IL 532-0018

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7. DESIGN LOADINGS

7.1 Design population equivalent (one population equivalent is 100 gallons of wastewater per day, containing 0.17 pounds of BOD_5 and 0.20 pounds of suspended solids;

BOD_____; Suspended Solids_____; Flow_____.

7.2 Design Average Flow Rate of West Basin - Intermittent 0.10 MGD.

7.3 Design Maximum Flow Rate of West Basin - Intermittent 0.864 MGD.

7.4 Design Minimum Flow Rate_____ MGD.

7.5 Minimum 7-day, 10-year low flow_____ cfs_____ MGD.

Minimum 7-day, 10-year flow obtained from_____.

7.6 Dilution Ratio_____;_____.

8. FLOW TO TREATMENT WORKS (if existing):

8.1 Flow (last 12 months)

8.1.1 Average Flow_____ MGD

8.1.2 Maximum Flow_____ MGD

8.2 Equipment used in determing above flows_____.

9. Has a preliminary engineering report for this project been submitted to this Agency for Approval?

YES__ NO X. If so, when was it submitted and approved. Date Submitted_____

Certification_____

Dated_____

10. List Permits previously issued for the facility: 1977-EB-3699, 1977-EB-3699-1

11. Describe provisions for operation during contingencies such as power failures, flooding, peak loads, equipment failure, maintenances shut-downs and other emergencies. Standby Power and Personnel (24 hour shift) are available).

12. Complete and submit Schedule G if sludge disposal will be required by this facility.

13. WASTE CHARACTERISTICS: . Schedule N must be submitted. No change since NPDES Permit Application (See Attachment)

14. TREATMENT WORKS OPERATOR CERTIFICATION: List names and certification numbers of certified operators:

Jim Herzau 343-60-5779

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Attachment

Waukegan Station plans to modify its Wastewater Treatment Systems by blocking off the existing outfall ditch for the West Area Basin (002) after its confluence with the abandoned Coal Pile Runoff outfall ditch. A two foot hole will then be cut in the bottom of the overflow pipe in the Coal Pile Runoff Basin and the operating level of the Coal Pile Runoff Basin will be lowered. This will allow any water discharged by the West Area Basin to flow by gravity via the old Coal Pile Runoff outfall ditch into the Coal Pile Runoff Basin, from whence it will be pumped to the Ash Ponds. The existing Ash Pond overflows (003 and 004) will be eliminated and high ash pond levels will be handled by diverting any excess water to the out-of-service Ash Pond, which will be empty. Treatment for oil and suspended solids will continue to be provided by the systems on the West Area Basin.

Benefits of this modification include the elimination of three outfalls, provision of additional treatment for solids to discharges from the West Area Basin and a reduction in the need to draw water from Lake Michigan to operate the Ash Transport System.

0005e
GME:dd

2022100581

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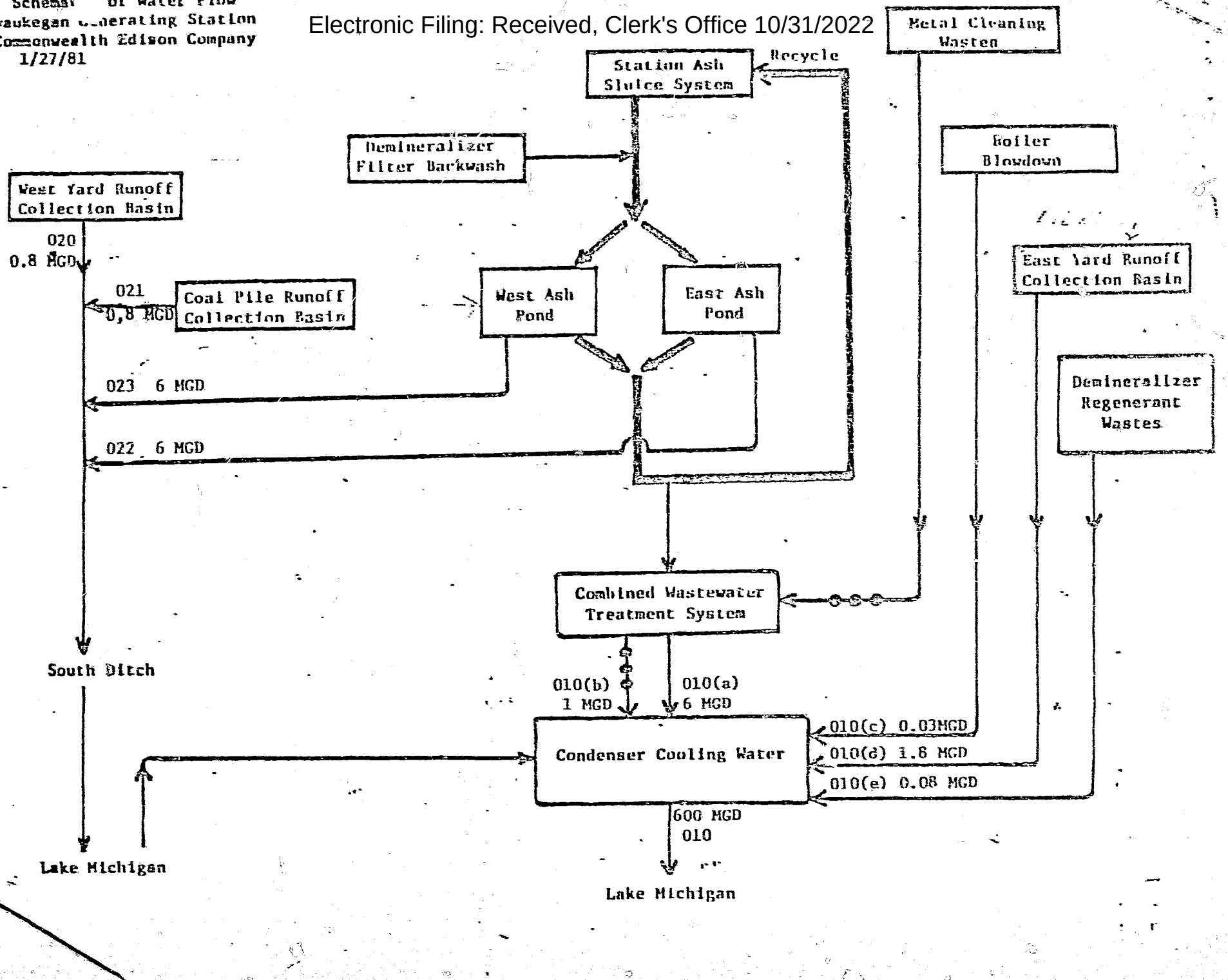
IL0 050 0025

Schemat of Water Flow
kaukegan Generating Station
Commonwealth Edison Company
1/27/81

TLD 000803635



Electronic Filing: Received, Clerk's Office 10/31/2022

EPA I.D. NUMBER

ILD 000803635

STATION: Waukegan

NPDES Pollutant Analysis -

Outfall: ~~020~~ 002 - West Yard Runoff Collection Basin

Sample Dates: March 24-25, 1981

	DETERMINATION	mg/l	lbs/day	DETERMINATION	mg/l	lbs/day
	FORM 2-C Part V-A			Parts V-C		
a	Bio Oxygen Demand	-	-	Metals, Cyanide, & Total Phenols		
b	Chem. Oxygen Demand	-	-	1M Antimony, Total	<1	<6.67
c	Total Organic Carbon	-	-	2M Arsenic, Total	0.002	0.013
d	Total Suspended Solids	-	-	3M Beryllium, Total	<0.02	<0.13
e	Ammonia (N)	-	-	4M Cadmium, Total	<0.02	<0.13
i	pH	-	-	5M Chromium, Total	<0.2	<0.67
	Part V-B			6M Copper, Total	<0.02	<0.13
a	Bromide	-	-	7M Lead, Total	<0.1	<0.67
b	Chlorine, T Residual	-	-	8M Mercury, Total	<0.0002	<0.0013
c	Color, Pt-Co Units	<5	-	9M Nickel, Total	<0.05	<0.33
d	Fecal Coliform/100ml	-	-	10M Selenium, Total	<0.002	<0.013
e	Fluoride	0.28	0.76	11M Silver, Total	<0.02	<0.13
f	Nitrate-Nitrite (N)	0.65	1.82	12M Thallium, Total	<0.001	<0.0067
g	Nitrogen, T Organic (N)	0.40	1.12	13M Zinc, Total	0.06	0.4
h	Oil and Grease	<1	<6.67	14M Cyanide, Total	<0.010	<0.067
i	Phosphorus, T (P)	0.061	0.41	15M Phenols, Total	<0.005	<0.03
k	Sulfate (SO_4)	528	3522			
l	Sulfide (S)	-	-			
m	Sulfite (SO_3)	-	-	Part V-B		
n	Surfactants	0.07	0.47		picocuries per liter	
o	Aluminum, Total	0.20	1.33	j Radioactivity		
p	Barium, Total	<1	<6.67	(1) Alpha, Total	-	-
q	Boron, Total	1.5	10	(2) Beta, Total	-	-
r	Cobalt, Total	<0.05	<0.33	(3) Radium, Total	-	-
s	Iron, Total	1.07	7.14	(4) Radium, 226	-	-
t	Magnesium, Total	39.3	262.2			
u	Molybdenum, Total	<0.2	<1.33	Temperature °F		
v	Manganese, Total	0.16	1.07			
w	Tin, Total	<0.5	<3.34			
x	Titanium, Total	<1	<6.67			

Note: Blank space indicates compound not found; dash indicates analysis not requested.

MS FRACTION COMPOUNDS

STATION: [illegible] EPA I.D. NUMBER: [illegible]

DISCHARGE: ~~020~~ 002 - West Yard Runoff Basin

Electronic Filing: Received, Clerk's Office 10/31/2022

DETERMINATION	mg/l	lbs/day
Part V-C (Con't)		
GC/MS Fraction Volatile Compounds		
1V Acrolein		
2V Acrylonitrile		
3V Benzene		
4V Bis (Chloromethyl) Ether		
5V Bromoform		
6V Carbon Tetrachloride		
7V Chlorobenzene		
8V Chlorodibromomethane		
9V Chloroethane		
10V 2-Chloroethylvinyl Ether		
11V Chloroform		
12V Dichlorobromomethane		
13V Dichlorodifluoromethane		
14V 1,1-Dichloroethane		
15V 1,2-Dichloroethane		
16V 1,1-Dichloroethylene		
17V 1,2-Dichloropropane		
18V 1,3-Dichloropropylene		
19V Ethylbenzene		
20V Methyl Bromide		
21V Methyl Chloride		
22V Methylene Chloride		
23V 1,1,2,2-Tetrachloroethane		
24V Tetrachloroethylene		
25V Toluene		
26V 1,2 Trans-Dichloroethylene		
27V 1,1,1-Trichloroethane	1	0.0067
28V 1,1,2-Trichloroethane		
29V Trichloroethylene		
30V Trichlorofluoromethane		
31V Vinyl chloride		
GC/MS Fraction — Acid Compounds		
1A 2-Chlorophenol		
2A 2,4-Dichlorophenol		
3A 2,4-Dimethylphenol		
4A 4,6-Dinitro-o-cresol		
5A 2,4-Dinitrophenol		
6A 2-Nitrophenol		
7A 4-Nitrophenol		
8A p-Chloro-m-cresol		
9A Pentachlorophenol		
10A Phenol		
11A 2,4,6-Trichlorophenol		
GC/MS Fraction Base Neutral Compounds		
1B Acenaphthene		

DETERMINATION	mg/l	lbs/day
Part V-C (Con't)		
2B Acenaphthylene		
3B Anthracene		
4B Benzidine		
5B Benzo (a) Anthracene		
6B Benzo (a) Pyrene		
7B 3,4-Benzofluoranthene		
8B Benzo (ghi) Perylene		
9B Benzo (k) Fluoranthene		
10B Bis (2-Chloroethoxy) Methane		
11B Bis (2-Chloroethyl) Ether		
12B Bis (2-Chloroisopropyl) Ether		
13B Bis (2-Ethylhexyl) Phthalate	18	0.12
14B 4-Bromophenyl Phenyl Ether		
15B Butyl Benzyl Phthalate	< 1	<0.0067
16B 2-Chloronaphthalene		
17B 4-Chlorophenyl Phenyl Ether		
18B Chrysene		
19B Dibenzo (a,h) Anthracene		
20B 1,2-Dichlorobenzene		
21B 1,3-Dichlorobenzene		
22B 1,4-Dichlorobenzene		
23B 3,3'-Dichlorobenzidine		
24B Diethyl Phthalate		
25B Dimethyl Phthalate		
26B Di-N-Butyl Phthalate	3	0.02
27B 2,4-Dinitrotoluene		
28B 2,6-Dinitrotoluene		
29B Di-N-Octyl Phthalate	< 1	<0.0067
30B 1,2-Diphenylhydrazine (as Azobenzene)		
31B Fluoranthene		
32B Fluorene		
33B Hexachlorobenzene		
34B Hexachlorobutadiene		
35B Hexachloro-cyclopentadiene		
36B Hexachloroethane		
37B Indeno (1,2,3 cd) Pyrene		

DETERMINATION	mg/l	lbs/day
Part V-C (Con't)		
38B Isophorone		
39B Naphthalene		
40B Nitrobenzene		
41B N-Nitrosodi-methylamine		
42B N-Nitrosodi-N-Propylamine		
43B N-Nitrosodi-phenylmine		
44B Phenanthrene		
45B Pyrene		
46B 1,2,4-Trichloro-benzene		
GC/MS Fraction Pesticides		
1P Aldrin		
2P α BHC		
3P β BHC		
4P γ BHC		
5P δ BHC		
6P Chlordane		
7P 4-4' DDT		
8P 4-4' DDE		
9P 4-4' DDD		
10P Dieldrin		
11P α Endosulfan		
12P β Endosulfan		
13P Endosulfan Sulfate		
14P Endrin		
15P Endrin Aldehyde		
16P Heptachlor		
17P Heptachlor Epoxide		
18P PCB-1242		
19P PCB-1254		
20P PCB-1221		
21P PCB-1232		
22P PCB-1248		
23P PCB-1260		
24P PCB-1016		
25P Toxaphene		

Note: Blank space indicates compound not found; dash indicates analysis not requested.

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STATION: Waukegan

NPDES Pollutant Analysis -

Outfall: ~~005~~ 001(E) - West Ash Pond

Sample Dates: March 24-25, 1981

	DETERMINATION	mg/l	lbs/day		DETERMINATION	mg/l	lbs/day
	FORM 2C Part V-A				Parts V-C		
a	Bio Oxygen Demand	-	-		Metals, Cyanide, & Total Phenols		
b	Chem. Oxygen Demand	-	-	1M	Antimony, Total	<1	<6.67
c	Total Organic Carbon	-	-	2M	Arsenic, Total	0.002	0.0133
d	Total Suspended Solids	-	-	3M	Beryllium, Total	<0.02	<0.133
e	Ammonia (N)	-	-	4M	Cadmium, Total	<0.02	<0.133
f	pH	-	-	5M	Chromium, Total	<0.1	<0.67
	Part V-B			6M	Copper, Total	<0.02	<0.133
a	Bromide	-	-	7M	Lead, Total	<0.1	<0.67
b	Chlorine, T Residual	-	-	8M	Mercury, Total	<0.0002	<0.0013
c	Color, Pt-Co Units	<5	-	9M	Nickel, Total	<0.05	<0.33
d	Fecal Coliform/100ml	-	-	10M	Selenium, Total	<0.002	<0.0133
e	Fluoride	0.15	1.0	11M	Silver, Total	<0.02	<0.133
f	Nitrate-Nitrite (N)	0.29	1.93	12M	Thallium, Total	<0.001	<0.0067
g	Nitrogen, T Organic (N)	0.34	2.27	13M	Zinc, Total	0.04	0.27
h	Oil and Grease	2	13.3	14M	Cyanide, Total	<0.010	<0.067
i	Phosphorus, T (P)	0.066	0.44	15M	Phenols, Total	<0.005	<0.033
k	Sulfate (SO_4)	35	233.4				
l	Sulfide (S)	-	-				
m	Sulfite (SO_3)	-	-		Part V-D		
n	Surfactants	-	-			picocuries per liter	
o	Aluminum, Total	0.3	2.0		1 Radioactivity		
p	Barium, Total	<1	< 6.67		(1) Alpha, Total	-	-
q	Boron, Total	0.02	0.133		(2) Beta, Total	-	-
r	Cobalt, Total	<0.05	< 0.33		(3) Radium, Total	-	-
s	Iron, Total	0.52	3.47		(4) Radium, 226	-	-
t	Magnesium, Total	7.8	52.0				
u	Molybdenum, Total	<0.2	<1.33		Temperature °F		
v	Manganese, Total	<0.02	<0.133				
w	Tin, Total	<0.5	<3.3				
x	Titanium, Total	<1	< 6.67				

Note: Blank space indicates compound not found; dash indicates analysis not requested.

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ACTION COMPOUNDS

ION: Waukegan EPA I.D. NUMBER ILD 000803635

001(c)

DISCHARGE: ~~023~~ - West Ash Pond

DETERMINATION	mg/l	lbs/day
Part V-C (Con't)		
GC/MS Fraction-Volatile Compounds		
1V Acrolein		
2V Acrylonitrile		
3V Benzene		
4V Bis (Chloromethyl) Ether		
5V Bromoform		
6V Carbon Tetrachloride		
7V Chlorobenzene		
8V Chlorodibromomethane		
9V Chloroethane		
10V 2-Chloroethylvinyl Ether		
11V Chloroform		
12V Dichlorobromomethane		
13V Dichlorodifluoromethane		
14V 1,1-Dichloroethane		
15V 1,2-Dichloroethane		
16V 1,1-Dichloroethylene		
17V 1,2-Dichloropropane		
18V 1,3-Dichloropropylene		
19V Ethylbenzene		
20V Methyl Bromide		
21V Methyl Chloride		
22V Methylene Chloride		
23V 1,1,2,2-Tetrachloroethane		
24V Tetrachloroethylene		
25V Toluene		
26V 1,2-Trans-Dichloroethylene		
27V 1,1,1-Trichloroethane		
28V 1,1,2-Trichloroethane		
29V Trichloroethylene		
30V Trichlorofluoromethane		
31V Vinyl Chloride		
GC/MS Fraction — Acid Compounds		
1A 2-Chlorophenol		
2A 2,4-Dichlorophenol		
3A 2,4-Dimethylphenol		
4A 4,6-Dinitro-o-cresol		
5A 2,4-Dinitrophenol		
6A 2-Nitrophenol		
7A 4-Nitrophenol		
8A p-Chloro-m-cresol		
9A Pentachlorophenol		
10A Phenol		
11A 2,4,6-Trichlorophenol		
GC/MS Fraction Base Neutral Compounds		
1B Acenaphthene		

DETERMINATION	mg/l	lbs/day
Part V-C (Con't)		
2B Acenaphthylene		
3B Anthracene		
4B Benzidine		
5B Benzo (a) Anthracene		
6B Benzo (a) Pyrene		
7B 3,4-Benzofluoranthene		
8B Benzo (ghi) Perylene		
9B Benzo (k) Fluoranthene		
10B Bis (2-Chloroethoxy) Methane		
11B Bis (2-Chloroethyl) Ether		
12B Bis (2-Chloroisopropyl) Ether		
13B Bis (2-Ethylhexyl) Phthalate	8	0.4
14B 4-Bromophenyl Phenyl Ether		
15B Butyl Benzyl Phthalate		
16B 2-Chloronaphthalene		
17B 4-Chlorophenyl Phenyl Ether		
18B Chrysene		
19B Dibenzo (a,h) Anthracene		
20B 1,2-Dichlorobenzene		
21B 1,3-Dichlorobenzene		
22B 1,4-Dichlorobenzene		
23B 3,3-Dichlorobenzidine		
24B Diethyl Phthalate		
25B Dimethyl Phthalate		
26B Di-N-Butyl Phthalate	2	0.1
27B 2,4-Dinitrotoluene		
28B 2,6-Dinitrotoluene		
29B Di-N-Octyl Phthalate		
30B 1,2-Diphenylhydrazine (as Azobenzene)		
31B Fluoranthene		
32B Fluorene		
33B Hexachlorobenzene		
34B Hexachlorobutadiene		
Hexachlorocyclopentadiene		
Hexachloroethane		
Indeno (1,2,3 cd) Pyrene		

DETERMINATION	mg/l	lbs/day
Part V-C (Con't)		
38B Isophorone		
39B Naphthalene		
40B Nitrobenzene		
41B N-Nitrosodi-methylamine		
42B N-Nitrosodi-N-Propylamine		
43B N-Nitrosodi-phenylmine		
44B Phenanthrene		
45B Pyrene		
46B 1,2,4-Trichloro-benzene		
GC/MS Fraction Pesticides		
1P Aldrin		
2P α BHC		
3P β BHC		
4P γ BHC		
5P δ BHC		
6P Chlordane		
7P 4-4' DDT		
8P 4-4' DDE		
9P 4-4 DDD		
10P Dieldrin		
11P α Endosulfan		
12P β Endosulfan		
13P Endosulfan Sulfate		
14P Endrin		
15P Endrin Aldehyde		
16P Heptachlor		
17P Heptachlor Epoxide		
18P PCB-1242		
19P PCB-1254		
20P PCB-1221		
21P PCB-1232		
22P PCB-1248		
23P PCB-1260		
24P PCB-1016		
25P Toxaphene		

Note: Blank space indicates compound not found; dash indicates analysis not requested.

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Exhibit

41

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PERMIT/PLAN/SPECIFICATION
MICROFILM "JACKET" INFORMATION

1. Division Code
2. FIPS County Code 097
3. City/Township Code 190
4. Governing Body Code 0500A
5. PERMITTEE NAME (File Subject)

   COMMONWEALTH ED - WAUKEGAN / AS BUILT
6. File Division 04
7. IEPA Permit Number 1977EB3499

CROSS-REFERENCE INFORMATION

8. Governing Body Name

   COMMONWEALTH EDISON COMPANY
9. F/S/P Code B0133
10. NPDES Number IL0002259

07580000075

MICROFILM

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WAUKEGAN

5082C5100 ¼ 2

EQUIPMENT AND STRUCTURE INDEX

SHADED ITEMS UNDER THIS CONTRACT

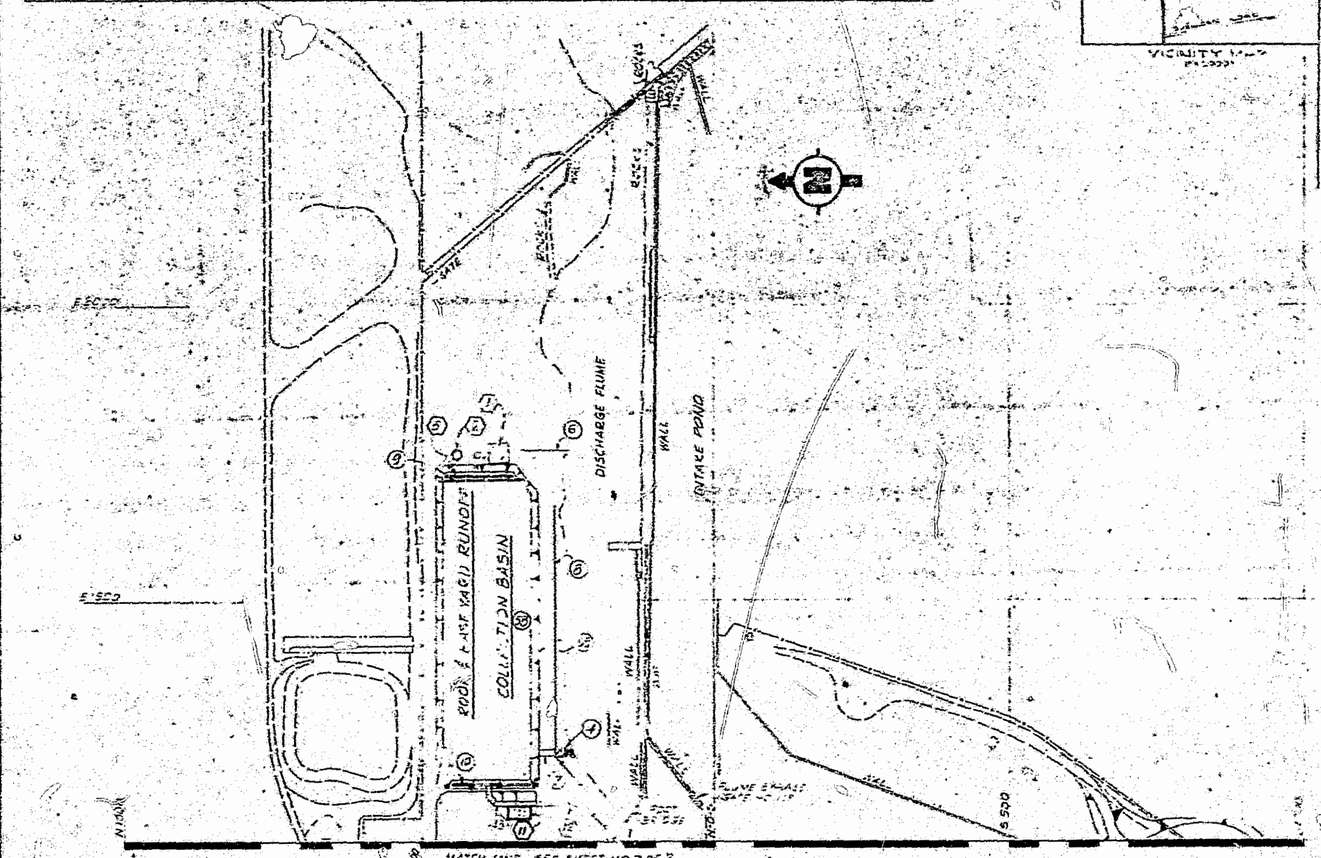
NO.	DESCRIPTION	EQUIP. TAG NO.	SPEC. NO. EARTHWORK	SPEC. NO. CIVIL/STRUCT.	DRAWING NOS.	REMARKS
1.	[illegible]	1GRY-104-D		P131	5105, [illegible]	INCLUDES MANHOLE & COLLECTION PIPE
2.	[illegible]	1GRY-113-T		P131	5106, 5[illegible]	
3.	TRANSFORMER FOUNDATION			P131	5[illegible]	2 SINGLE & 1 DOUBLE
4.	[illegible]		P102		5105, 5115	
5.	[illegible]			P131		
6.	[illegible] (TO BE RELAYED)		P102	P131	5003, 5004, 5006, 5006, 5011	INSTALL UNDER SPEC NO. P102 REMOVE UNDER SPEC NO. P131
7.	[illegible]		P102		5003, 5505	[illegible]
8.	SHEET PILING		P102		5001, 5003, 5504	
9.	[illegible]		P102		5003, 5506	
10.	[illegible]		P102		5001, 5008	
11.	[illegible]	1GRY-105-S		P131	5105, 5624-26	
12.	EAST YARD INLET DITCH		P102		5001, 5003	
13.	CURBING			P131	5101, 5102, 5104	LOAD, ASH POND NO. II
14.	[illegible]	[illegible]		P131	5101, 5103, 5518, 5523	
15.	FLOOR DRAIN SURGE TANK	1GFD-111-T		P131	5101, 5103, 5523	
16.	OIL SEPARATOR	1GFD-103-D		P131	501, 5103, 5523	
17.	[illegible]	1AFD-[illegible] 1GFD-113-P			5101, 5115, 5523	
18.	CLARIFIER OVERFLOW SUMP	1GBA-103-N		P131	5101, 5104, 5205, 5[illegible], 5203	
19.	METAL CLEANING WASTE OVERFLOW NEUTRAL SUMP	1GMC-105-N 1GMC-103-L		P131	5101, 5104, 5209, 5[illegible]	
20.	[illegible]	[illegible]		P131	5101, 5[illegible], 5613, 5560	
21.	PIPEWAY			P131	5101, 5102, 5106,	
22.	BLOWDOWN CLARIFIERS (2)	1GBA-115-TA&B 1GBA-[illegible]		P131	5101, 5104, 5607, 5[illegible]	
23.	METAL CLEANING WASTE UNDERFLOW SUMP & PIPING	1GMC-106-N 1GMC-104-PA&B		P131	5101, 5104, 5609, 5[illegible]	
24.	ACID STORAGE TANK	1GMC-[illegible]		P131	5101, 5104, 5613, 56[illegible]	
25.	AIR COMPRESSOR & PUMP PAD	1GMC-101-C		P131	5101, 5104, 5342	
26.	METAL CLEANING WASTE EQUALIZATION TANK	1GMC-107-T 1GMC-[illegible]		P131	5101, 5104, 5613	
27.	WEST YARD DRAINAGE CHANNEL		P102		5004	
28.	MAIN WASTE TREATMENT BLDG.	[illegible]		P131	[illegible]	
29.	BLOW DOWN CLARIFIER SLUDGE SUMP	[illegible]		P131	5101, 5104, 5607, 5[illegible]	
30.	[illegible]			P131	5101, 5104, 5518	
31.	[illegible]	1GRV-105-2		P131	5105, 5624-26, 30, [illegible]	
32.	[illegible]		P102		5004, 5506	
33.	[illegible]	[illegible]		P131	5105, 5[illegible]	
34.	[illegible]	1GRY-105-D		P131	5105, 5[illegible]	INCLUDES MANHOLE & COLLECTION PIPE
35.	CLARIFIER VALVE BOX			P131	510[illegible], 5[illegible], 5652, [illegible]	
36.	[illegible] OUTFLOW WELL		P102		5504, 5505	
37.	CLARIFIER VALVE BOX			P131	510[illegible], 5[illegible], 5[illegible]	
38.	PIPE CULVERT (36" DIA.)		P102		5004, 5011	
39.	OVERFLOW DITCH NO 2		P102		5004, 5005, 5011	
40.	ACID STORAGE TANK	[illegible]		P131	5101, 5[illegible], 5613, 5[illegible]	
41.	MAIN COLLECTION TANK	1GBA-105-T		P131	5101, 5[illegible], 5[illegible], 5[illegible]	
42.	[illegible]			P131	5[illegible]	
43.	INLET FLUME		P102		5004, 5005, 5008	3 LOCATIONS
44.	COAL PILE RUNOFF POND SUMP	[illegible]		P131	5[illegible]	
45.	[illegible]		P102		5003, 5504	
46.	[illegible]		P102		5003, 5502, 5507	
47.	[illegible]		P102		5003, 5502, 5507	
48.	[illegible]	1GCR-124-H	P102		5003, 5508	
49.	INLET FLUME DISTRIBUTION TROUGH (LINED ASH POND NO. I)		P102		5006, 5009, 5502, 5[illegible]	
50	INLET FLUME DISTRIBUTION TROUGH (LINED ASH POND NO. II		P102		5005	
51	COAL PILE RUNOFF DITCH		P102		5005, 5006, 5008, 5[illegible]	
52.	OVERFLOW DITCH NO. 3		P102		5005, 5006, 5[illegible]	
53.	ASH POND SUMP & WEIR		P102		5005, 5501, 5503	
54.	GRATED TRENCH		P102		5004, 5005, 5[illegible], 5507	3 REQUIRED
55.	PIPE CULVERTS (42" DIA)		P102		5005	3 LOCATIONS
56.	RECLAIM HOPPER SUMP PUMP DISCHARGE LINE		P102		5008, 5009	
57.	GRADING & SEEDING		P102		5004, 5005	[illegible]
58.	[illegible]		P102		5001, 5008	
59.	[illegible]		P102		5004, 5011	
60.	COAL PILE BASIN		P102		5003, 5011	
61.	ASH POND NO. I		P102		5005, 5007	
62.	ASH POND NO. II		P102		5006, 5007	
63.	BITUMINOUS CONCRETE CURB			P131	5101, 5107	AT SWITCHYARD & SOUTH YARD
64.	PIPEWAY		P102		5006, 5008, 5101, 5102	GRADING & 4" GRAVEL SURFACE ON 6" BRUSH GRADED BASE COURSE REQ.
65.	GUARD RAIL		P102			N/A
66.	CHAIN GUARD					N/A
67.	PIPE BRIDGE		P102		5008, 5009	SEE "GE"
68.	HEAVY DUTY PIPE TRENCH		P102		5005, 5507	
69.	[illegible]			P131	5104, 5[illegible]	
70.	[illegible]	[illegible]		P131	5101, 5104, 5[illegible], 5107	
71.	PIPE BRIDGE			P131	[illegible]	
72.	PIPE TRENCH AT MAIN COLL. TANK			P131	5101 – 5103, [illegible], 5627 – 5681	
73.	PUMP HOUSE AT MAIN COLL. TANK			P131	5101, 5108, 5608, [illegible], 5[illegible]	

* SEE NEBIAD FOR EQUIPMENT TAG NO.

EQUIPMENT AND STRUCTURE INDEX (CONT.)

SHADED ITEMS UNDER THIS CONTRACT

NO.	DESCRIPTION	EQUIP. TAG NO.	SPEC. NO. EARTHWORK	SPEC. NO. CIVIL/STRUCT.	DRAWING NOS.	REMARKS
74.	BOTTOM ASH CONVEYOR & SUMP & PUMP	1GBA-[illegible] 1GBA-103-T		P131	5102	
75.	OUTSIDE YARD BILGE SUMP	1GRY-108-N		P131	5101, 5[illegible]	



VICINITY MAP

LEGEND

	EXISTING	PROPOSED
ELEVATION (TOP OF CURB)	468	
ELEVATIONS (flow line)	20	5[illegible]
SPOT GRADE	5x6	+3[illegible]
LOW POINT	X L.P. 21.6	+ L.P. 5.61
HIGH POINT	X H.P. 23.7	+ H.P. 7.52
FENCE	-x-x-x-	-x-x-x-
PROPERTY LINE		
RIGHT OF WAY	R/W	R/W
CENTER LINE (STREET)		
ROADWAY - PAVED		
ROADWAY - GRAVEL		
RAIL ROAD TRACK		
TRACK ELEVATION (TOP OF RAIL)		T.R. 31.2
DRAINAGE FLOW		
STREAM (WATERS EDGE)		
POND OR LAKE		
LOW AREA		
SWAMP		
TEST BORINGS SURVEYING CONTROL PROPERTY CORNER		
BENCH MARK W/ELEV.	457.9	
TRAVERSE STATION	N 256.25 E 560.78	
GUARD RAILS		
TRANSMISSION POLE		
TRANSMISSION TOWER		

	EXISTING	PROPOSED
STRUCTURES BUILDINGS (EARTHWORK INCLUDES [illegible])		
[illegible]		
[illegible]		TOP EL. 25.0
FINISHED FLOOR ELEVATIONS 1ST FLOOR		E.F.S.L. 78.25
FINISHED FLOOR 2ND FLOOR		2ND FL. EL. 86.5
EMBANKMENT (SLOPES)		
HEADWALL CULVERT (PIPE DIAMETER & TYPE)		HW 15" RCP
CONCRETE CURB & GUTTER		
ELEVATION (TOP OF CURB)		T.C. 7.25
INLET (CATCH BASIN) STREET		+16.25
INLET (CATCH BASIN) YARD		14.2
INVERT ELEVATION PIPE OR DITCH	+12.6	INV. 13.2
DRAINAGE DITCH - SODDED		(S)
DRAINAGE DITCH - CONCRETE		(CONC)
DRAINAGE DITCH - BITUMINOUS CONCRETE FLUME (SEPARATE CROSSING)		(BIT)
STORM SEWER MANHOLE	M.H.	M.H.
RIPRAP		
DIKE SLOPE INTERCEPTOR DITCH		
LIMIT OF CONSTRUCTION AREA		

GRAPHIC SCALE

RADIUS	R
TANGENT	T
LENGTH (ARC)	L
CHORD	CH
CHORD BEARING	CH. B.
POINT OF LINE	P.O.L.
POINT OF CURVATURE	P.C.
POINT OF TANGENT	P.T.
POINT OF INTERSECTION	P.I.
VERTICAL CURVE	V.C.
POINT OF VERTICAL CURVE	P.V.C.
POINT OF VERTICAL TANGENT	P.V.T.
POINT OF VERTICAL INTERSECTION	P.V.I.
POINT OF CURVE	P.O.C.
EXTERNAL DISTANCE PI TO CURVE	E

REVISIONS

NO.	DESCRIPTION	DATE
1	[illegible]	[illegible]
2	[illegible]	[illegible]

07580000076
MICROFILM

APPROVED FOR CONSTRUCTION
3/5/79

COMMONWEALTH EDISON COMPANY
WASTE WATER TREATMENT FACILITIES
WAUKEGAN

LOCATION AND PLOT PLAN

CECO CONTRACT NO. 80870
CECO DWG. NO. 5082C5100
SHEET 1 OF 2

5082C5100

REVISIONS
NO. | DESCRIPTION
1 | APPROVED FOR CONSTRUCTION

MATCH LINE SEE SHEET 1 OF 2

INTAKE POND
DISCHARGE FLUME
IMPROVED ACCESS ROADWAY (BY OTHERS)
COAL PILE
HEAVY SLUDGE DUMP AREA
250,000 GAL. COND. WATER STORAGE TANK
ASH SILO
RECLAIM HOPPER & PUMPS
LINED ASH POND #II
LINED ASH POND #I
POWER GENERATING PLANT
PRECIPITATORS
PRECIPITATORS SUMP
EXIST. CONTR. BY OTHS.
COAL PILE RUNOFF BASIN
CULVERTS
PEAKING UNITS
138 KV SWITCH YARD
AREA TO BE GRADED & SEEDED (BY OTHERS)
WEST YARD RUNOFF COLLECTION BASIN
ACCESS ROAD (BY OTHERS)
MATCH LINE - THIS SHEET
PROPERTY LINE
PARKING AREA
WATER

LEGEND
STRUCTURE
ROADWAY
DRAINAGE DITCH
EARTHWORK CONTRACT (BY OTHERS)
CIVIL STRUCTURAL CONTRACT (THIS CONTRACT)
GRAPHIC SCALE

0758000077
MICROFILM

APPROVED FOR CONSTRUCTION
5/6/78

COMMONWEALTH EDISON COMPANY
WASTE WATER TREATMENT FACILITIES
WAUKEGAN

LOCATION AND PLOT PLAN

NUS CORPORATION ROCKVILLE, MD.
5082C5100
1

5082 C5101 2

SILOS

CONST. PILING

HOPPER SHEET FLOW LINK 2.5

PROPOSE ROOFING PATCH

INV. 3.7

INV. 3.9

INV. 3.9

15" C.M.P.

12" C.M.P.

INV. 3.5

BILGE SUMP W/ OPENING IN WALL @ INV. 2.5

PROVIDE 1'-6" OPENING IN EXIST. GATE WELL @ INV. 4.2

PRECIPITATORS

EXISTING SLUICE GATE

TOP OF RAIL & TOP OF CONC. ELEV. 5.94

BOILER ROOM DRAIN SUMP

250,000 GAL. CONCRETE STORAGE TANK

CHIMNEY UNIT 4

CHIMNEY UNIT 3

PRECIPITATOR

PRECIPITATORS

EXISTING BRIDGE

P.I. #6

P.I. #7

DEWATERING BINS

DOOR SILL ELEV. 6.97

TRANSFER HOUSE

CURB

P.I. #6

PEDESTRIAN

TRANSFORMERS

CURB

TOP OF CONC. FOUNDATION CORNER ELEV. 6.44

TRANSFORMERS

TRANSFORMERS

TRANSFORMERS

CRIB HOUSE

CRIB HOUSE

CRIB HOUSE

CONC. FENCE

INV. 8.00

6" CONC. CATCH BASIN @ 8.54

INV. 5.84 (FROM WEST)

345 KV SWITCH YARD

345 KV CONN.

PASSIVE AREA

ROAD CENTERLINES

TABLE OF COORDINATES & CURVE DATA

NO.	P.I.	Δ	R	ARC	TAN	CHORD
1	5113.07 N643.04	21°43'	225'	39.27'	25.25'	39.03'
2	5160.64 N589.50	34°03'	237'	140.57'	74.52'	138.50'
3	5112.28 N237.68	81°27'	179'	340.78'	150.66'	312.35'
4	5362.43 N191.28	27°18'	170'	34.00'	61.35	33.22'
5	5480.00 N172.27	22°53'	230'	102.52'	12.43	101.80'
6	5435.00 E85.31	15°00'	125'	26.18'	13.12'	26.15'
7	5432.00 E113.67	15°00'	125'	26.18'	13.14'	26.15'
8	5452.00 E237.68	9°00'	225'	35.34'	17.74'	35.31'
9	5309.09 N384.02	14°00'	180'	44.01'	22.24'	43.91'
10	5403.18 N411.00	3°00'	200'	27.93'	13.97'	27.90'
11	5505.00 N457.57	66°00'	95'	109.41'	61.80'	103.50'
12	5521.00 N439.63	66°00'	100'	115.19'	64.54'	108.93'
13	5315.64 N733.28	34°30'	215'	129.47'	67.03'	127.50'
14	5127.58 N838.04	6°30'	59'	6.93'	3.47'	6.93'
15	5413.30 W671.05	23°30'	57'	23.38'	11.85'	23.22'
16	5430.00 W710.45	23°30'	160'	65.62'	33.26'	65.16'

SECTION

SCALE: 1/2" = 1'-0"

CLASS "A" CONC. W/ 6"x6"-W5.5xW5 WIRE MESH

10'-6"

4.0%

4.0%

PEDESTRIAN GRADE

RAIL GRADE

COAL PILE GROOMING LANE

CAQ DUMPER

BREAKER BUILDING

PILE

COAL EQUIPMENT STORAGE BUILDING

TOP OF WEST RIM VALVE MH ELEV. 8.52

CURB

INTAKE

CLARIFIER

CLARIFIER

CLARIFIER

EXISTING CROSSING

ACCESS ROAD

CROSSING

MAIN

SERVICE ROAD

EPS

EPS

TOP OF CONC. CORNER ELEV. 5.81

LEAKING UNITS

SERVICE ROAD "B"

SWEET YARD DRAINAGE CHANNEL (BY OTHERS)

CROSSING REMOVED

EXIST. CONC. APRON

PLACE ASPHALT CONC. OVERLAY ON EXIST. ROAD TO WEST EXIST. R.R. GRADE.

END PAVING

GATE

40' SEAWEL TRANSITION

PLUMBERS

PIPE

P.I. #1

P.I. #2

P.I. #3

P.I. #4

P.I. #5

P.I. #8

P.I. #9

P.I. #10

P.I. #11

P.I. #12

P.I. #13

P.I. #14

P.I. #15

P.I. #16

P.I. #17

P.C. STA. 2+71.97

P.T. STA. 3+02.76

P.C. STA. 3+23.15

P.T. STA. 3+42.60

P.C. STA. 4+17.44

P.C. STA. 5+63.77

P.C. STA. 5+87.16

P.C. STA. 6+28.77

P.T. STA. 6+42.77

P.C. STA. 10+26.89

P.T. STA. 10+37.20

P.T. STA. 11+02.76

P.T. STA. 11+39.15

P.T. STA. 11+42.60

P.T. STA. 11+52.67

P.T. STA. 11+58.67

P.T. STA. 11+62.67

P.T. STA. 11+66.67

P.T. STA. 11+70.67

P.T. STA. 11+74.67

P.T. STA. 11+78.67

P.T. STA. 11+82.67

P.T. STA. 11+86.67

P.T. STA. 11+90.67

P.T. STA. 11+94.67

P.T. STA. 11+98.67

P.T. STA. 12+02.67

P.T. STA. 12+06.67

P.T. STA. 12+10.67

P.T. STA. 12+14.67

P.T. STA. 12+18.67

P.T. STA. 12+22.67

P.T. STA. 12+26.67

P.T. STA. 12+30.67

P.T. STA. 12+34.67

P.T. STA. 12+38.67

P.T. STA. 12+42.67

P.T. STA. 12+46.67

P.T. STA. 12+50.67

P.T. STA.

Electronic Filing: Received, Clerk's Office 10/31/2022

EQUIP. TAG NO.	STANDARD/SPEC. NO.	M.E.P.R. NO.	SHT. NO.
16BA-100-S	MP 157	452	5
16BA-102-T	MP 141	771	5
16BA-103-T	MP 141	771	5
16BA-144-PA	MP 147	893	5
16BA-144-PB	MP 147	893	5
16BA-145-PA	MP 147	893	5
16BA-145-PB	MP 147	893	5
16BA-115-TA	5082 P131	440	4
16PS-103-P	MP 167	806	4
16BA-115-TB	5082 P131	440	4
16PS-104-P	MP 167	806	4
16BA-102-N	5082-P-131		4
16BA-107-PA	MP 167	806	4
16BA-107-PB	MP 167	606	4
16BA-103-N	5082-P-131		4
16BA-108-PA	MP 154	884	4
16BA-108-PB	MP 154	884	4
16BA-106-L	MP 142	456	4
16BA-105-T	MP 158	772	3
16BA-101-X	MP 160	455	3
16BA-100-PA	MP 139	444	3
16BA-100-PB	MP 139	444	3
16BA-100-PC	MP 139	444	3
16BA-100-NA	5082-P-102		3
16BA-100-NB	5082-P-102		3
16BA-100-L	MP 164	984	3
16BA-100-CA	MP 134	439	3
16BA-100-CB	MP 134	439	3
16BA-116-N	5082-P-131		3
16BA-104-PA	MP 153	449	3
16BA-104-PB	MP 153	449	3
16BA-104-PC	MP 153	449	3
16BA-128-PA	MP 153	449	2
16BA-128-PB	MP 153	449	2
16BA-116-T	MP 149	702	2
16BA-129-PA	MP 153	449	2
16BA-129-PB	MP 153	449	2
16BA-117-T	MP 149	702	2
16BA-100-J	5082-P177		3
16BA-123-N	5082-P-131		2
16BA-105-PA	MP 154	884	3
16BA-105-PB	MP 154	884	3
16BA-105-PC	MP 154	884	3
16BA-100-DA	MP 135	440	
16BA-100-DB	MP 135	440	

REV.	DESCRIPTION
1	APPROVED FOR CONSTRUCTION 7-27-79
2	INCORP. DCN # 208 ADDED M.E.P.R. NOS. & EQUIP. TAG NOS. FROM 8-00-252 SPEC. 5082-P-132, 865 FDW-6"-202-939, BAS-4"-202 REVISED & ADDED HT. TRACING & ANTI SWEAT INSUL. & CONN. REVISED. CHKD. COG. ENGR. MECH. MGR. PE-MS 3-00-320 ELECT./I.C. + MET. CIVIL/STRUCT. PROJ. ENGR. 2-21-79

NOTES:

1. ASH SLUICE PUMPS TO BE INTERLOCKED WITH ASH SLUICE RETURN PUMPS.
2. CONTROL SHOULD BE PROVIDED TO ALARM ON LOW LEVEL IN HEAD TANK & TRIP ASH SLUICE PUMPS OFF ON LOW-LOW LEVEL.
3. MAKE-UP WATER & HYDROGEN COOLER RETURN WATER ARE VALVED OUT OF UNITS 7 & 8 HEAD TANK DURING NORMAL RECYCLE OPERATION.
4. EXISTING PUMPS TO BE SHUT OFF.
5. EXISTING VALVES TO BE CLOSED.

UNIT 5 - ASH SLUICE PIT

07580000079
MICROFILM

APPROVED FOR CONSTRUCTION

COMMONWEALTH EDISON COMPANY
WASTE WATER TREATMENT FACILITIES - WAUKEGAN
BOTTOM ASH SLUICE SYSTEM
PIPING & INSTRUMENTATION DIAGRAM

NUS CORPORATION ROCKVILLE, MD. 5082ME3003 2

83-1

Electronic Filing: Received, Clerk's Office 10/31/2022

5082ME3003 2

TO ASH POND DWG. ME3003-3(C-7)

BAS 10"-203-387

FROM UNIT 6 BOT. ASH L.P DRAIN DWG. ME3003-1(C-1)

BAS 4"-202

BAS 4"-202

TO ASH POND DWG. ME3003-3(C-7)

TO DEWATERING BINS DWG. ME3003-1(C-4)

UNIT 8 PYRITES

FROM ECON. FLY ASH SLUICE L.P DRAIN DWG. ME3021-1(B-2)

AHS 4"-202-013

LOW PRESSURE SERVICE WATER

EXIST. JET PUMP

EXISTING SLUICE NOZZLES (TYP.)

EXIST JET PUMP

FROM 7A & 7B ASH SLUICE PUMPS DWG. ME-3002-1(C-5)

16BA-100-3
BOT. ASH L.P DR. SUMP JET PUMP
CAP: 267 GPM SUCT. @ 82 FT. DISCH. HEAD
MAT'L BRONZE
MOTIVE FLUID: 55# GPM @ 140 PSI

UNIT 7 REHEAT FURNACE ASH HOPPER

UNIT 7 SUPERHEAT FURNACE ASH HOPPER

O/F

UNIT 8 REHEAT FURNACE ASH HOPPER

UNIT 8 SUPERHEAT FURNACE ASH HOPPER

UNIT 7 PYRITES 54L DWG. M600 (C-3)

HIGH PRESSURE SERVICE WATER 51L DWG. M800 (C-3)

LOW PRESSURE SERVICE WATER 54L DWG. M800 (C-3)

MCS-8"-202-328

MCS-8"-202-327

MCS-8"-202-326

16BA-130-PA/B
BOTTOM ASH L.P DRAIN SUMP
CAP: 7000 GAL.
MAT'L: CONCRETE
SIZE: 10'-10"x10' DEEP

UNIT 8 LOW LEVEL ECON. JETPULSION PUMPS (OUT OF SERVICE)

TO UNIT 8 AIR SER. TANK DRAIN HEADER ECON. FLY ASH SYS. DWG. ME3021-1(B-2)

EAW-4"-300-071

EXIST O/F TO DISCH. CANAL

FOR DETAILS OF METAL CLEANING ASH HOPPER OVERFLOWS SEE DWG. ME3005-1

FROM HEAD TANK LEVEL SWITCH DWG. ME3003-1(C-5)

FROM UNIT 7&8 HEAD TANK DWG. ME3003-1(D-5)

FROM DEWATERING BINS DRIP PAN DRAIN DWG. ME3003-1(B-1)

BAW 6"-201-374

ASH HOPPER 7B SEAL WATER O/F METAL CLEANING WASTE SYS. DWG. ME3005-1(C-2)

MCS 6"-202-295

UNIT 7 AIR HEATER WASH DRAINS METAL CLEANING WASTE SYS. DWG. ME3005-1(C-2)

MCS 8"-202-313

ASH HOPPER 7A SEAL WATER O/F METAL CLEANING WASTE SYS. DWG. ME3005-1(B-2)

MCS 4"-202-301

MCS 4"-202-298

UNIT 8 ASH SLUICE PUMPS

BAS-8"-201-389 (PARTIAL H.T. + F.P. INSUL.)

TO MAIN COLLECTION TANK DWG. ME3003-3(D-7)

UNIT 8 AIR HEATER WASH DRAINS METAL CLEANING WASTE SYS. DWG. ME-3005-2(C-2)

MCS-8"-202-322

MCS-8"-202-332

MCS 6"-202-324

UNITS 7&8 AIR HTR. BASKET WASH-METAL CLG. WASTE SYS. DWG. ME 3005-2(C-2)

FROM PLANT FILTER BACKWASH HEADER

EMERGENCY TANK OVERFLOW TO DISCH. TUNNELS

EMERGENCY TANK OVERFLOW TO DISCH. CANAL

BAW-8"-201-417

BAS 2"-202-408

BAS 2"-202-406

BAS 2"-202-407

5-3/4" SPRAY NOZZLES

BAW 2"-202-403

BAW 2"-202-394

5-3/4" SPRAY NOZZLES

16BA-116-T

PSW-3/4"-201-956

16BA-117-T

PSW-3/4"-201-955

PSW-3/4"-201-957

PSW-3/4"-201-958

PSW-3/4"-201-959

PSW-3/4"-160

PSW-3/4"-160

PSW-3/4"-201-954

PSW-3/4"-201-965

BAS 10"-202-409

PSW-3"-201-404

MCS 8"-202-402

MCS 8"-202-415

TO WASTE WATER EQUALIZATION TANK METAL CLEANING SYS. DWG. ME3005-4(E-7)

TO MAIN COLLECTION TANK BOTTOM ASH SYS. DWG. ME3003-3(D-7)

BAS 8"-202-401 (PARTIAL F.P. INSUL. + H.T.)

BAS 5"-202-415 (PARTIAL F.P. INSUL. + H.T.)

UNIT 7 BLR. AREA SERVICE WATER HEADER (EXIST)

PSW 3"-201-390

PSW 3"-201-390

PSW-3"-201-391

PSW-1½"-201-418

16BA-116-T
UNIT 7 ASH HOPPER OVERFLOW TANK
CAP: 3250 GALS.
SIZE: 7'-6"W x 16'-6"L x 6'-0"H
MAT'L: C.S.

16BA-128-PA

16BA-128-PB

BAS 6"-202-397

BAS 10"-202-396

BAS 2"-202-393

BAS 2"-202-392

BAS 5"-202-398

BAS 8"-202-399

BAS 8"-202-400

16BA-129-PA

16BA-129-PB

BAS 5"-202-413

BAS 8"-202-412

BAS-10"-202-410

16BA-117-T
UNIT 8 ASH HOPPER OVERFLOW TANK
CAP: 3250 GALS.
SIZE: 7'-6"W x 16'-6"L x 6'-0"H
MAT'L: C.S.

L.P. DRAIN

16BA-129-PA/B
UNIT 7 OVERFLOW PUMPS 7A (7B)
CAP. EA: 1000 G.P.M. @ 49 FT. T.D.H.
MOTOR HP: 25, BELT DRIVEN
NOTE ①②④⑤
MAT'L: C.I., METAL LINING
GLAND SEAL WTR: 15 G.P.M. @ 26 P.S.I.

16BA-129-PA/B
UNIT 8 OVERFLOW PUMPS 8A (8B)
CAP. EA: 1000 G.P.M. @ 49 FT. T.D.H.
MOTOR HP: 25, BELT DRIVEN
NOTE ①②④⑤
MAT'L: C.I., METAL LINING
GLAND SEAL WTR: 15 G.P.M. @ 26 P.S.I.

TO EFA SLUICE PUMPS DWG. ME 3121-1(A-2)

NOTES:
FOR UNITS NO. 7 & 8 OVERFLOW PUMPS
① ONE PUMP OF EACH UNIT IN CONTINUOUS OPERATION, ONE STAND-BY.
② BOTH PUMPS ARE STARTED AND STOPED MANUALLY.
③ OPERATING PUMP WILL TRIP AT LOW LEVEL AND RESTART AUTOMATICALLY
④ HANDSWITCHES 39A&B AND 39A&B AND ANNUNCIATORS 84C, 215, 216 AND 817 DESIGNATED "U7" INDICATES THAT THESE ITEMS ARE LOCATED ON THE UNIT 7 STATION CONTROL PANEL.

EQUIP LIST (DWG: ME3003-1)

PARTS LIST

REF ITEM	DESCRIPTION	REQ'D	IDENTIFICATION MATERIAL	IDENTIFICATION PART NO. OR SPECIFICATION

EQUIPMENT SPECIFICATION LIST SEE DWG. ME3003-1

REV	DESCRIPTION	
1	APPROVED FOR CONSTRUCTION 7-27-78	
2	REVISED INSULATION & GEN UP DATE AS NOTED CHECKED COG ENGR ELECT/I.C. CIVIL/STRUCT. MECH MGR. PE-HA 3-10-20 PROJ ENGR 3-21-79	

07580000080
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APPROVED FOR CONSTRUCTION

COMMONWEALTH EDISON COMPANY
WASTE WATER TREATMENT FACILITIES-WAUKEGAN
BOTTOM ASH SLUICE SYSTEM
PIPING & INSTRUMENTATION DIAGRAM

NUS CORPORATION ROCKVILLE MD

5082ME3003 2

SHEET 2 OF 5

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5082ME3003 · 2

16BA-151-X
AIR SPARGER
CAP. 6 SCFM EA.
40 DIFFUSERS

16BA-100-FA
CENTRIFUGAL SEPARATOR
CAP: 3700 GPM MAX.
MAT'L. C.S., HEAT TRACED & INSULATED, NOTE (3)

16BA-100-NA
ASH POND 1
CAP: 10 ACRES-15' DP
MAT'L. EARTHEN
HYPALON LINED

16BA-100-FB
CENTRIFUGAL SEPARATOR
CAP. 3700 GPM MAX.
MAT'L. C.S., HEAT TRACED

16BA-100-FC
CENTRIFUGAL SEPARATOR
CAP. 3700 GPM MAX
MAT'L. C.S., HEAT TRACED

16BA-100-L
STATIC MIXER
SIZE: 20"-3 ELEMENTS

16BA-100-NB
ASH POND 2
CAP 10 ACRES-15' DP
MATL EARTHEN
HYPALON LINED

EQUIPMENT SPECIFICATION LIST-
SEE DWG ME2003-1

REVISIONS

REV	DESCRIPTION
1	APPROVED FOR CONSTRUCTION 7-27-78
2	REV'D. & ADDED HT. TRACING AND SEQ. INSULATION REQUIREMENTS & SEQ. REVS. DELETED NOTE 5, ADDED NOTE 3. CHKD. CDS. ENGR. NEW NOZZLE ELEC'L & C&I STRAP PROJ. ENGR. 2-21-79

FROM ACID METERING PUMPS DWG. ME3003-5 (C-1)

FROM HIGH QUALITY ELEC. BLOWDOWN TANK DWG. ME3007-1 (C-1)

FROM UNIT 6 DEWATERING BIN OVERFLOW & UNDERFLOW DWGS. ME3003-1(B-2)

FROM HEAD TANK OVERFLOW DWG. ME3003-1 (D-5)

FROM OVERFLOW TANK UNIT 7 DWG. ME3003-2 (B-4)

FROM OVERFLOW TANK UNIT 8 DWG. ME3003-2(B-3)

FROM FILTER BACKWASH DWG. ME3003-2(C-1)

FROM B/C OVERFLOW SUMP BOTTOM ASH SLUICE SYSTEM DWG. ME3003-4 (C-1)

FROM UNITS 4,7, & 8 ECONOMIZER ASH COLLECTION TANK DWG. ME-3021 (B-2)

FROM UNIT 7 ASH HOPPER SLUICE DWG. ME3003-2 (E-3)

FROM UNIT 8 ASH HOPPER SLUICE DWG. ME3003-2 (E-5)

FROM B/C SLUDGE SUMP BOTTOM ASH SLUICE SYSTEM DWG. ME3003-4 (B-5)

TO SLUICE SYSTEM HEAD TANK DWG. ME3003-1(D-7)

FOR INST. AIR DIST. SEE DWG. ME3025-2

TO BLOWDOWN CLARIFIER BOTTOM ASH SLUICE SYS. DWG. ME3003-4(C-7)

TO B/D CLARIFIER FEED LINE, DWG. ME3003-4(C-7)

TO MAIN COLL. TANK AREA SUMP ME3008-1 (E-7)

16BA-100-NA ASH POND 1

16BA-100-NB ASH POND 2

16BA-105-T

16BA-116-N

16BA-105-PA, 16BA-105-PB, 16BA-105-PC

INTAKE FLUME

TANK DRAIN

INTERLOCK

TRACE

24" x 18" RED

NOTES:

1. ASH POND SUMP COMMUNICATES IN BOTH ASH PONDS AND CAN BE ISOLATED FROM EITHER POND TO FACILITATE CLEANOUT.
2. HANDSWITCHES HS 352 M, AB, AC DESIGNATED UG AND HS 352 BA, BB & BC DESIGNATED U7 INDICATES THAT THESE ITEMS ARE LOCATED ON BOTTOM ASH PANEL AT UNIT 6 SLUICE PUMP STATION WITH REPEATER AT UNIT 7. SIMILARLY LAL 907 A&B AND LAH 819 A&B.
3. EQUIPMENT INSULATION SCHEDULE DWG. ME 3206-1&2.
4. DELETED
5. DELETED
6. A.O. SMITH BIG THREAD PIPE - STRUCTURAL CAGE OF ISOPHTHALIC L.V.I. 40 MIL. VINYL ESTER LINER

16BA-100-FA/B
* AIR BLOWERS
CAP. EACH 450 SCFM @ 7 PSI
H.P. 30
SUPPLIED BY VENDOR

16BA-104-PA, 16BA-104-PB, 16BA-104-PC
MAIN COLLECTION TANK PUMPS
CAP. EACH: 6900 G.P.M. @ 50.3 FT. TDH
MAT'L: C.I.
MOTOR: HP 125 BELT DRIVE
GLAND SEAL W. 30 GPM EA. AT 22 PSI
16BA-116-N
SLUICE WATER RETURN SUMP
CAP: 120,000 GAL 30'x30'x18' DP
MAT'L: CONCRETE

16BA-105-PA, 16BA-105-PB & 16BA-105-PC
SLUICE WATER RETURN SUMP PUMPS
CAP. EACH: 7500 GPM @ 68 FT. TDH
MAT'L: C.I.
H.P. = 200

MAIN COLLECTION TANK PUMP HOUSE

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APPROVED FOR CONSTRUCTION

COMMONWEALTH EDISON COMPANY
WASTEWATER TREATMENT FACILITIES - WAUKEGAN
BOTTOM ASH SLUICE SYSTEM
PIPING & INSTRUMENTATION DIAGRAM

NUS CORPORATION
5082ME3003 REV 2
SHEET 3 of 5

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5082ME3003 Rev 2

16BA-115-TA - CONTAINER
16BA-100-DA - INTERNALS
BLOWDOWN CLARIFIER
SIZE: 95'8 x 14' DP. W/12' SWD
MAT'L: CONCRETE W/C.S. INTERNALS EPOXY COATED

16PS-163-P
VALVE PIT A SUMP PUMP
CAP 25 GPM @ 25' TDH
H.P.: ½

16BA-115-TB CONTAINER
16BA-100-DB INTERNALS
BLOWDOWN CLARIFIER
SIZE: 95'8 x 14' DP. W/12' SWD
MAT'L: CONCRETE W/C.S. INTERNALS EPOXY COATED

16PA-164-P
VALVE PIT B SUMP PUMP
CAP 25 GPM @ 25' TDH
H.P.: ½

PARTS LIST

REF	ITEM	DESCRIPTION	REQ'D	IDENTIFICATION MATERIAL	IDENTIFICATION PART NO. OR SPECIFICATION

EQUIPMENT SPECIFICATION LIST SEE DWG. ME3003-1

REVISIONS

REV	DESCRIPTION
1	APPROVED FOR CONSTRUCTION 7-27-78
2	ADDED & REV'D. INSULATION REQUIREMENTS & GEN. REVS. CHK'D. COG. ENGR. MECH. MGR. PE #2 39020 ELEC./I&C CIVIL/STRUCT. PROJECT ENGR 2-21-79

FROM ALUM FEED SYS DWG ME3005-5(B-2)
MCG-1"-102-807
BAP-1"-260-174
MCP-1"-260-461
BAE-12"-201-150
BAE-12"-201-170
BAP-¾-260-175
BAS 12-201-135
BAS12"-201-135
BAP-1"-260-176
SLUDGE XL 834
LIQUID XL 835
SLUDGE XL 836
LIQUID XL 837
MCG-1"-102-808
MCP-1"-260-462
MCG-1"-102-809
MCP-1"-260-463
SCUM BOX
CONC. VALVE PIT A
BAS 1"-202-151
BAS 1"-202-152
BAS 1"-202-153
SAMPLE LINES
BAS-1"-202-154
O/F TROUGH
UNDERFLOW SLUDGE TROUGH
VALVE PIT A
VALVE PIT B
BAS-6"-202-643
BAS-6"-202-644
BAE-14"-201-178
BAE-14"-201-171
BAE-14"-201-179
MCS-10"-202-460
MCS-10"-202-461
BAS 1"-202-157
BAS 1"-202-158
BAS-1"-202-159
BAS-1"-202-160
CONC. VALVE PIT B
BAD 6"-201-652
SEE NOTE ⑤
MCS-12"-201-439 SEE NOTE ⑤
TO OVERFLOW SUMP METAL CLEANING WASTE SYS. DWG ME3005-5(C-4)
FROM FLASH MIX TANK MTL CLG. WASTE SYS. DWG. ME3005-4 (D-1)
MCS-10"-202-421
FROM POLYMER FEED SYS. DWG. ME3003-5(D-1)
FROM METAL CLEANING POLYMER FEED SYS DWG ME3005-4(E-4)
FROM SLUICE WTR. RET. SUMP BOTTOM ASH SLUICE SYS. DWG. ME 3003-3(D-1)
FROM SERVICE WTR. SYS. DWG. ME3025-1 (C-6)
FROM ASH POND SUMP DWG. ME3003-3 (D-4)
FROM METAL CLEANING SYSTEM COLLECTION DRAIN SUMP DWG: ME3005-5(C-7)
MCS-4"-201-744
BAS-12"-201-122
BAS-10"-201-122
BAS 12"-201-470
EAS-12"-201-122
PSW 4"-201-134
PSW 2"-201-134
PSW 2"-201-141
PSW 2"-201-145
BAD-6"-202-647
BAD-6"-202-649
BAD-6"-202-646
BAD-6"-202-648
TO POLYMER FEED PKG. DWG. ME3003-5(C-2)
TIMER
SET @ 25 P.S.I.G.
CONC. VALVE PIT A
CONC VALVE PIT B
FROM ACID PUMP DWG. ME3003-5(C-1)
BAA 1"-201-735
PSW-6"-201-396
FROM SERVICE WATER SYS. DWG. ME3025-1 (C-6)
PSW-6"-201-857
CONC. VALVE PIT
BAD 6"-202-644
BAD 6"-202-645
BAD 6"-202-652
BAD 6"-202-171
BAD 6"-202-172
BAD-1"-201-1
TO ASH POND 2 BOTTOM ASH SLUICE SYS. DWG. ME3003-3(C-7)
SLUDGE TO METAL CLEANING UNDERFLOW SUMP DWG ME 3005-5 (B-3)
SLUICE GATE
BAD 1"-202
BAD-1"-202-1
BAD-1"-202-2
16BA-107-PA
16BA-107-PB
BAE-12"-201-168
BAE 12"-201-170
BAE 16"-201-163
BAE-1"-201-165
BAE 16"-201-164
BAE-16"-201-166
BAE-15"-201-450
BAE-15"-201-799
BAA 1"-201-795
BAA-1"-201-471
SEE NOTE ③
MTL CLG SYS NEUT. SUMP DISCHARGE DWG. ME-3005-4 (B-5)
BAE-3"-201 DRAIN
16BA-108-PA
16BA-108-PB
BAE-1"-201
BAE-2"-201
BAFFLE
EPOXY LINED
16BA-106-L
AMBIENT INPUT
INTERLOCK
TIMER
TRACE INSULATE
THIS VALVE TO BE OPEN FOR F.P.
F.P.
F.C.
TO MAIN COLLECTION TRENCH ASH SLUICE SYS. DWG ME3003-3(D-7)
INSULATE OUTSIDE BARE PIPE INSIDE
UNIT 8 KINGHOLE
UNIT 8 DISCH. CANAL
GRAB SAMPLE
LAH LAL 835 836
LS 1639
LS 1638
PU IA
CONC. VALVE PIT

METAL CLEANING UNDERFLOW SUMP

FOR PUMP AND SUMP DETAILS SEE DWG. ME3005-5 (B-2)

16BA-102-N
BLOWDOWN CLARIFIER SLUDGE SUMP
CAP: 6700 GAL., 8'x8'x 21'-0" DP.
MAT'L.: CONCRETE-EPOXY COATED

16BA-107-PA & 16BA-107-PB
BLOWDOWN CLARIFIER SLUDGE SUMP PUMPS, BELT DRIVE
CAP EACH: 450 GPM, 99 FT. TDH
MAT'L.: C.I.
MOTOR: 30 HP

METAL CLEANING NEUTRALIZATION SUMP

FOR PUMP AND SUMP DETAILS SEE DWG. ME3005-5(B-5)

16BA-103-N
CLARIFIER OVERFLOW SUMP
CAP: 30,000 GAL., 32'x16'x17' DP.
MAT'L.: CONCRETE - NEUTRALIZATION COMPARTMENT - EPOXY LINED

16BA-108-PA & 16BA-108-PB
CLARIFIER O/F SUMP PUMPS
EACH CAP: 475 GPM, 43 FT. TDH
MAT'L.: C.I.
H.P.: 125

16BA-106-L
CLARIFIER O/F SUMP MIXER
TYPE: TURBINE, 4 BLADES
RPM: 68
MAT'L: CARBON STEEL
MOTOR: 7.5 HP

NOTES:
① BOTTOM ASH AND METAL CLEANING WASTE O/F SUMPS ARE COMBINED INTO A SINGLE SUMP.
② BOTTOM ASH AND METAL CLEANING W/F SUMPS ARE TWO SEPARATE CONTIGUOUS SUMPS WITH A SLUICE GATE BETWEEN THEM.
③ DOW POLYPROPYLENE LINED (PPL) STEEL PIPE. DOW PPL 150# CAST STEEL FITTINGS, MOULDED RAISED FACE FLANGED JOINTS. DOW FIG Nº 235 FULL PPL SPACERS FOR ATTACHMENT TO NON PPL FLANGES. DOW FIG 351 CAST STEEL PPL DIAPHRAGM VALVES, CAST STEEL BONNETS, VITON B DIAPHRAGMS, OR (ZDM1 STD M-246) DOW FIG Nº 325 PPL 150# ANSI STEEL REDUCING FILLER FLANGES FOR CONNECTION TO ½" CONTROL VALVES ACV-56 & ACV 234.
④ VALVE FC 158 WILL CLOSE IF A LOW LEVEL IS REACHED IN THE ASH POND SUMP OR ALL THREE SLUICE WATER RETURN PUMPS ARE TURNED OFF.
⑤ NOTED LINES WILL CHANGE MAT'L CLASS TO 10S WHENEVER BURIED. FOR CLASS CHANGE SEE PIPING ARR'GT DWG ME 3161.

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APPROVED FOR CONSTRUCTION

	COMMONWEALTH EDISON COMPANY	
	WASTE WATER TREATMENT FACILITIES-WAUKEGAN	
	BOTTOM ASH SLUICE SYSTEM PIPING & INSTRUMENTATION DIAGRAM	
CECO CONTRACT 802670	CECO DWG. NO. 5082ME3003	REV 2
NUS CORPORATION ROCKVILLE MD	SCALE NONE	SHEET 4 of 5

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5082ME3003

16BA-103-T
ACID STORAGE TANK
CAP: 18000 GALS. VERTICAL, 12'6"x29'H
MATL: S.S. TANK INSULATION PER DWG. ME 3206-2

16BA-102-T
ACID STORAGE TANK
CAP: 18000 GALS. VERTICAL 12'6"x 22'H.
MATL: S.S. TANK INSULATION PER DWG. ME 3206-2

PARTS LIST					
REF	ITEM	DESCRIPTION	REQ'D	IDENTIFICATION MATERIAL	IDENTIFICATION PART NO. OR SPECIFICATION

16BA-100-S
POLYMER FEED PACKAGE
CAP: 40 LBS. DRY BASIN
FEED RATE: 0 TO 210 GPH

EQUIPMENT SPECIFICATION LIST
SEE DWG. ME 3095-1

REVISIONS		
REV	DESCRIPTION	
1	APPROVED FOR CONSTRUCTION	7-27-78
2	REVD & ADDED VALVING REQUIREMENTS, DELETED LINES BAA-3"-100-SB & BAA-3"-100-SC3 REV. POLYMER PKG LAYOUT & GEN REVS. CHKD. COG. ENGR. MECH. MECH. PE ME 3095 ELECT/I.C. CIVIL/STRUCT PROJ. ENGR.	2-21-79

TRUCK FILL CONN.
INSULATION
RECIRC. LINE
SET @ 30 PSIG
IMMERSION HEATERS
INSULATE BOTTOM OF TANK W/ 1½" FOAMGLAS INSULATION.
24" MANWAY
DRYER
8" VENT
SET @ 50 PSIG
SET @ 42 PSIG
SET @ 24 PSIG
PULSATION DAMPENER ASSEMBLY
FOR PACKAGE P&ID SEE DWG. ME 3024-1
MIXING TANK O/F BAP-1½"-260
AGING TANK O/F & DRAIN BAP-3"-260-150
TO FLOOR DRAINS
POLYMER FEED TO BLOWDOWN CLARIFIER DWG. ME3003-4 (D-7)
MIXING TEE 1½"x1½"
ROTAMETER 2"x1½"
FROM BLOWDOWN CLARIFIER DWG. ME3003-4 (C-6)
TO MTL. CLN. O/F SUMP DWG. ME 3005-5 (C-4)
TO CLARIFIER OVERFLOW SUMP DWG ME 3003-4 (C-7)
TO SLUICE SYS. - RECYCLE LINE STATIC MIXER DWG ME3003-31E-7)
WATER INLET TO MIXING TANK DWG. ME 3025-1 (C-5)
WATER SUPPLY TO MIXING TEE DWG. ME 3025-1 (C-5)

16BA-144-PA,B
ACID METERING PUMP
TYPE: VARIABLE STROKE
CAP: 175 MAX G.P.M. @ 50 PSIG MAX.
MATL: TEFLON DIAPHRAGM HYDRAULIC HEAD
MOTOR: ¼ H.P.

16BA-145-PA/B
ACID METERING PUMP
TYPE: VARIABLE STROKE
CAP: 1.75 MAX G.P.M. @ 50 PSIG MAX
MATL: TEFLON DIAPHRAGM HYDRAULIC HEAD
MOTOR: ½ H.P.

NOTES:
SEE DWG. ME 3003-4

APPROVED FOR CONSTRUCTION

COMMONWEALTH EDISON COMPANY
WASTEWATER TREATMENT FACILITIES - WALKER
BOTTOM ASH SLUICE SYSTEM
PIPING & INSTRUMENTATION DIAGRAM
NUS CORPORATION ROCKVILLE MD
5082ME3003 2
SHEET 5 OF 5

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5082ME3004

EQUIP TAG NO.	STANDARD/SPEC. N°	M.E.P.R. N°
16DW-106-T	MP-161	773
16DW-110-PB	MP-169	
16DW-110-PA	MP-169	
16DW-105-LA	MP-163	
16DW-105-LB	MP-163	
16DW-105-LC	MP-163	
16DW-105-LD	MP-163	
16DW-105-LE	MP-163	
16DW-165-PA		
16DW-165-PB		
16DW-126-N	5082-P131	
16DW-124-T	5082-P179	
16DW-159-PA	MP-159	
16DW-159-PB	MP-159	
16DW-160-PA	MP-159	
16DW-160-PB	MP-169	

REV. 1 APPROVED FOR CONSTRUCTION 7-27-78

16DW-160-PA, 16DW-160-PB
2 DRAIN WASTE PUMPS
CAP. EACH: 50 G.P.M @ 57' TDH
MAT'L: F.R.P.
HP EACH: 2 HP.

LEAKAGE FROM UNIT 2 DEMINERALIZER TRAIN

2 STORAGE TANKS
EACH CAP: 12,000 GALS.
MAT'L: FRP

DRAIN WASTE SUMP
(UNIT 2 DEMINERALIZERS)
CAP: 500 GALS.
SIZE: 6'x6'x4' DP.
MAT'L: EPOXY LINED CONCRETE

16DW-106-T
EQUALIZATION TANK
CAP: 150,000 GALS.
SIZE: 30'ϕ x 31'H
MAT'L: FRP

INSIDE OUTSIDE

REGENERANT WASTE FROM UNITS 1 & 2

EXIST. STORAGE TANK O/F TO UNIT 4 DISCH CANAL

LEAKAGE FROM UNIT 1 DEMINERALIZER TRAIN

SAMPLE DRAINS

DEMIN. WASTE O/F SUMP

16DW-165-PA/B
NOTE (2)
EXISTING DISCHARGE PUMPS
CAP. EACH: 400 GPM @ 180 FT. TDH
IN-LINE INGERSOLL RAND
3550 RPM

16DW-124-T
DRAIN WASTE TANK
(UNIT 1 DEMINERALIZERS)
CAP: 750 GALS.
SIZE: 5'x5'x4' DP.
MAT'L: FRP

250 GAL FREE BOARD

500 GAL

16DW-159-PA

16DW-159-PA, 16DW-159-PB
2 DRAIN WASTE PUMPS
CAP. EACH: 50 G.P.M. @ 57' TDH
MAT'L: FRP
MOTOR: 2 HP
ONE PUMP OPERATING, ONE SPARE

16DW-105-LA/I
9 EQUALIZATION TANK EDUCTORS
SIZE: 3½"
CAP. EA.: 27.7 GPM @ 29 PSI ΔP
MAT'L: POLYPROPYLENE

EXISTING DEMIN. WASTE LINE TO BE REMOVED

16DW-110-PA, 16DW-110-PB
2 EQUALIZATION DISCHARGE PUMPS
CAP. EA.: 1000 GPM @ 30 FT. TDH (DISCHARGE COND.)
240 GPM @ 72 FT. TDH (RECYCLE COND.)
MAT'L: FRP
MOTORS: 10 HP
ONE PUMP OPERATING, ONE SPARE

DISCH./AUTO/RECYCLE

TO DISCHARGE CANAL

TO DISCHARGE CANAL

RECIRCULATION & EQUALIZATION

NOTES:
1. VALVE TO BE LEFT PARTIALLY OPEN TO SERVE DUAL PURPOSE OF EMERGENCY BY-PASS AND RELIEF ORIFICE
2. EXISTING DISCHARGE PUMP IMPELLERS WILL BE CHANGED TO REDUCE THE TDH TO BE 57 FEET
3. AREA BENEATH VALVES, TANK NOZZLES AND PUMPS IS COVERED WITH LIMESTONE GRAVEL.

APPROVED FOR CONSTRUCTION

COMMONWEALTH EDISON COMPANY
WASTE WATER TREATMENT FACILITIES-WAUKEGAN
DEMINERALIZER WASTE EQUALIZATION SYS.
PIPING & INSTRUMENTATION DIAGRAM

DRAWING NO. 5082ME3004 REV. 1
SCALE: NONE SHEET 1 OF 1

NUS CORPORATION ROCKVILLE, MD.

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5082ME3005 1

EQUIP. TAG NO.	STANDARD/SPEC. NO	M.E.P.R. NO.	SHT. NO.
16MC-114-N	5082-P-102		2
16MC-100-X	MP-160	455	4
16MC-112-PB	MP-147		4
16MC-125-T	MP-141		5
16MC-107-T	MP 158		4
16MC-101-S	MP 157	458	4
16MC-108-T	MP 141		4
16MC-109-T	5082-P-131		4
16MC-102-L	MP 142		4
16MC-101-C	MP 134	439	4
16MC-111-PA	MP 153	449	4
16MC-111-PB	MP 153	449	4
16MC-112-PA	MP 147		4
16MC-101-F	MP 140	445	5
16MC-108-S	MP-136	770	5
16MC-110-T	MP 141		5
16MC-104-L	MP 142		5
16MC-104-N	5082-P-131		5
16MC-113-PA	MP 154		5
16MC-113-PB	MP 154		5
16MC-103-L	MP 142		5
16MC-105-N	5082-P-131		5
16MC-158-PA	MP 147		5
16MC-158-PB	MP 147		5
16MC-106-N	5082-P-102		5
16MC-114-PA	MP 152		5
16MC-114-PB	MP 152		5
16MC-101-PA	MP 171		
16MC-101-PB	MP 171		

REVISIONS	
REV.	DESCRIPTION
1	APPROVED FOR CONSTRUCTION 7-27-78

FROM ABANDONED UNIT 7 ECON. FLY ASH CONNECTIONS

HP SERVICE WATER-SLOPE WASH

HP SERVICE WATER GAS SIDE WASH - DWG.

8"

UNIT 7B AIR HEATER — AIR SIDE | GAS SIDE

UNIT 7A AIR HEATER — AIR SIDE | GAS SIDE

UNIT 7B BOILER — REHEAT FURNACE | ECONO-MIZER

UNIT 7A BOILER — ECONO-MIZER | SUPERHEAT FURNACE

SLIDE GATE (TYP. 12 PLCS)

¼"/FT SLOPE

MCS 4"-202-291

MCS 6"-202-295

MCS 8"-202-313

MCS 8"-202-302

OVERFLOW 8"

MCS 3"-202-290

MCS 3"-202-289

MCS 3"-202-293

MCS 3"-202-292

ASH HOPPER 7B

MCS 4"-202-298

MCS 3"-202-297

MCS 3"-202-296

ASH HOPPER 7A

MCS 3"-202-303

MCS 3"-202-300

MCS 3"-202-299

MCS 4"-202-301

PORTION OF EXIST. 8" O/F LINE FROM ASH HOPPER 7-B TO BE RE-USED FOR HOPPER 7-A. (MCS 8"-202-305)

BLOCKED AREA IS PART OF BOTTOM ASH SYSTEM FOR DETAIL SEE DWG. ME3003-2

7A & 7B ASH SLUICE PUMPS DWG. [illegible]

2½"

HOLD

FLEX HOSE

CLINKER GRINDER

16 MC-Latin-PB

6"

10"

JET PUMP

NEW ASH HOPPER OVERFLOW TANK

2 ASH HOPPER O/F PUMPS

TO WASTE WATER STORAGE TANK DWG. ME 3005-4 (E-7)

TO MAIN COLLECTION TANK DWG. ME3003-4 (C-7)

TO ASH POND SEE DWG. ME 3003-2 FOR DETAILS

16-MC-Latin-PA & PB

UNIT 7 ASH HOPPER DRAIN PUMPS
TYPE: PORTABLE, AIR DRIVEN, DIAPHRAGM PUMP
CAP: [illegible] G.P.M. EACH

NOTES:
1. 5082 ME 3005-3 VOIDED.

APPROVED FOR CONSTRUCTION

COMMONWEALTH EDISON COMPANY
WASTEWATER TREATMENT FACILITIES-WAUKEGAN
METAL CLEANING WASTE SYSTEM
PIPING & INSTRUMENTATION DIAGRAM

NUS CORPORATION ROCKVILLE MD

5082ME3005 REV. 1

SCALE NONE SHEET 1 OF 5

83-77

07580000085
MICROFILM

Electronic Filing: Received, Clerk's Office 10/31/2022

5082ME3005

PARTS LIST					
REFERENCE	DESCRIPTION	REQ'D	IDENTIFICATION		
			MATERIAL	PART NO. OR SPECIFICATION	

REVISIONS	
REV	DESCRIPTION
1	APPROVED FOR CONSTRUCTION 7-27-78

EQUIPMENT SPECIFICATION LIST — SEE DWG. ME3005-1

HP SERVICE WATER SLOPE WASH DWG &c.

HP SERVICE WATER GAS SIDE WASH DWG &c.

MCW 3"-201-325

MCW

MCW

16 MC-114-N UNITS 7 & 8 LJUNGSTROM AIR HEATER BASKET WASH AREA

GRATING

1" x 4" EXP METAL SCREENING SECTION

ELEV. 52'-0"

20' x 20' DRAINED AREA 16 MC-114-N

SCREEN 1/4" OPENINGS

MCS6"-202-324

UNIT 8 BOILER — SUPERHEAT FURNACE

ECONO-MIZER

UNIT 8 AIR HEATER — AIR SIDE / GAS SIDE

UNIT 8 AIR HEATER — AIR SIDE / GAS SIDE

ECONO-MIZER

UNIT 8 BOILER — REHEAT FURNACE

MCS 8"-202-338

MCS 8"-202-322

ASH HOPPER

HOLD

TO BOT ASH DEWAT. BINS DWG ME 3003-1

EXIT U-8 SLUICE WTR

UNIT 8 ASH PIT JET PUMP A

8A & 8B ASH SLUICE PUMPS DWG ME3003-2 (C-3)

CLINKER GRINDER

CLINKER GRINDER

FOR DETAILS OF ASH HOPPER OVERFLOW LINE AND BLOCKED AREA SEE DWG. ME 3003-2.

UNIT 8 ASH PIT JET PUMP B

CLINKER GRINDER

CLINKER GRINDER

NEW ASH HOPPER OVERFLOW TANK

2 ASH HOPPER OVERFLOW PUMPS

TO WASTE WATER STORAGE TANK DWG. ME3005-4 (E-7)

TO MAIN COLLECTION TANK DWG ME3003-4 (C-7)

TO ASH POND FOR DETAILS SEE DWG. 3003-2

FROM U-8 HCBW SYSTEM DWG ME 3007-2 (C-1)

O/F BOX

FLOOR

4" FLEX HOSE

MCS 3" 202-346

HOLD

JET PUMP

MCS 3" 202-346

HOLD

UNIT 8 SUP. HT FURNACE ASH PIT

EXIST ASH PIT SUMP

O/F BOX

FLOOR

HOLD

MCS 3" 202-346

JET PUMP

HOLD

MCS 3" 202-346

EXIST ASH PIT SUMP

O/F BOX

FLOOR

EXIST UNIT 8 REHEAT FURNACE ASH PIT

10"

UNIT 8 ASH CANAL

30620 REGISTERED PROFESSIONAL ENGINEER OF ILLINOIS

APPROVED FOR CONSTRUCTION

DRAWN R. SILELAND	Date 7/27/78	COMMONWEALTH EDISON COMPANY WASTEWATER TREATMENT FACILITIES — WAUKEGAN
CHECKED		METAL CLEANING WASTE SYSTEM PIPING & INSTRUMENTATION DIAGRAM
LEAD ENGINEER		
ENGR'G MGR. APPR'D		
APPROVAL PROJECT ENGR.		CONTRACT NO. 8-210
APPROVAL		DRAWING NO. 5082ME3005
APPROVAL PROJ. MGR.		REV 1
APPROVAL CHIEF		SCALE 1" = 1'-0" SHEET OF

NORTHERN ENGINEERING CONSTRUCTION CORP. ROCKY

93-8

07580000086

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5082ME3005

16MC-107-T
WASTE WATER
EQUALIZATION TANK
SIZE: 36'9" X 36'5S
WORKING VOL: 260,000 GALS.
MAT'L: C.S.

16MC-100-X
AIR SPARGER
CAP. EA: 215 SCFM
NO. OF UNITS: 40
MAT'L: FRP

16MC-101-S
POLYMER FEED PACKAGE SYSTEM
CAP: 0-60 GPH @ 0.025% SOLN. STRENGTH

16MC-108-T
CAUSTIC STORAGE TANK
SIZE: 10'9" x 10'5S
WORKING VOL: 5000 GALS.
MAT'L: C.S. WITH 1/8" CORR. ALLOWANCE.

16MC-109-T
FLASH MIX TANK
SIZE: 11'L x 11'W x 10'D
WORKING VOL: 8100 GALS.
MAT'L: EPOXY LINED CONCRETE

16MC-102-L
FLASH MIX TANK MIXER
TYPE: 4 BLADE TURBINE
SPEED: 68 RPM
MOTOR: 15 HP.
MAT'L: CARBON STEEL
WEIGHT: 1372 LBS.

EQUIPMENT SPECIFICATION LIST SEE DWG. ME-3005-1

REVISIONS		
REV.	DESCRIPTION	
	APPROVED FOR CONSTRUCTION	7-27-78

FROM V-7 ASH HOPPER O/F TANK ME 3003-2 (B-4)
FROM V-8 ASH HOPPER O/F TANK ME 3003-2 (B-4)
MCS 8"-202-402
BAS-8"-202-416
MCS10"-202-420
MC1 10"-201
VENT
16MC-100-X
16-MC-107-T
OVER FLOW
MCS-10"-201-891
NOTE (1)
201
202
MCS-6"-202-440
FLUSH CONN.
MCS 1½"-202
MCS10"-202-423
MC1-1½"-201-428
MC1- 1½"-201
DRAIN TO GRADE
HS 401
P3
P1 121
OUTLET SNUBBER
FILTER SILENCER
INLET SNUBBER
8"x6" RED ELL
FLEX JOINT (TYP.)
T1
T2
MCS10"-202-424
MCS-1"-202
PI 222A
MCS-1½"-202
MCS-6"-202-426
16MC-111-PA
FLUSH CONN.
HS 402A
MCS 2"-202
1"x 3/8" RED
SERVICE WTR DWG. ME3025-1 (C-4)
PSW 1"-201
PSW 1"-201-888
16MC-101-C
AIR BLOWER PACKAGE
TWO-STAGE ROTARY
CAP. 1100 ACFM @ 15 PSI
MOTOR: 100 HP.
MAT'L: CARBON STL.

SERVICE WATER DWG. ME3025-1 (C-5)
PSW- 1"-201-851
MCW-¾"-201
PACKAGED POLYMER FEED SYSTEM DWG. C-M2001
16MC-101-S
MCP-1"-260-430
MCS-6"-202-422
MCS-6"-202-428
MCP-1"-260-461
TO BOTTOM ASH BLOWDOWN CLARIFIER ME 3003-4 (C-7)
MCS8"-202-428
LT 220A
LI 220
LA 220
MCS-8"-202-722
FIY 223A
MCC-1"-210-784
MCC-1"-210
MCC-1"-210-733
MCC-3"-210-742
MCC 3"-210
MCC-6"-210-788
MCC3"-210-789
24" MANHOLE O/F
FILL CONN.
LS 225
LI 225
LAL 866
AS 224A
AIC 224A
AY 224A
AIC 224B
MCC1"-210-784
MCC1"-210-435
MCC 1"-210-436
MCC½"-210-435
ACV 224A
ACV 224B
ACV 224C
PS 224
MCC1½"-210-436
MCS-3"-202-459
FILTRATE FROM VACUUM FILTERS DWG. ME 3005-5(C-2)
MCS-3"-202-460
SLUDGE FROM CLARIFIER U/F SUMP DWG. ME 3005-5(C-4)
MCS10"-202-421
TO BOTTOM ASH BLOWDOWN CLARIFIER DWG. ME 3003-4(D-7)
FIT 223
FE 223
MCS2"-202
FAL 869
FS 223
FR 223
AR 224
TO ALUM FEED SYSTEM DWG. ME 3005-5 (C-2)
FSV 242A
SET @ 22 PSIG
FSV 242B
SET @ 15 PSIG
MCC1"-210-725
MCC1"-210
PI 242B
MICROFLOC
FLUSH CONN.
LOCATE IN MU. TREAT. BLDG
MCC1"-210
PULSATION DAMPENER
MCC1"-210-434
MCC1"-210-787
FSV 241A
PI 224A
SET @ 15 PSIG.
MCC1"-210-786
MCC1"-210-483
MCC1"-210-430
MCC1"-210-431
MCC1"-210-432
MCC1"-210-481
MCC1"-210-482
260 210
16MC-112-PA
16MC-112-PB
HS 403A
HS 403B
FLOOR TRENCH
TO COLLECTION DRAIN SUMP DWG. ME 3005-5(C-7)
FROM COLLECTION DRAIN SUMP DWG. ME 3005-5(C-7)
MCS-4"-201-745
AS 224-1
AAH AAL 867 868
AS 224-2
AIT 224
AE 224
AR 224
FR 223
HS 404
M
MCS 10"-202-425
MCS 8"-202-427
MCS 2"-202
PSW 1"-201-834
PSW 1"-201

16MC-111-PA + PB
WASTE WATER FEED PUMPS
CAP. EA: 1100 GPM @ 36 FT. TDH
MOTOR: 20 HR
MAT'L: HI. CHROME ALLOY

16MC-112-PA/B
(2) CAUSTIC FEED PUMPS
TYPE: POSITIVE DISPLACEMENT/ ADJUSTABLE STROKE
CAP. EA: 3.0 GPM @ 15 PSIG
MOTOR: ¼ H.P.
MAT'L: TEFLON DIAPHRAGM / PVC HEAD

NOTES:
(1) TANK O/F IS DIRECTED TO ROOF & YARD RUNOFF SYSTEM.

APPROVED FOR CONSTRUCTION

DRAWN	DR Stuber	7-27-78
CHECKED	RB	7-27-78
COST ENGINEER		
CHIEF MECHANICAL ENGR.		
APPROVED		
APPROVED		
APPROVED FOR CONST.		
APPROVED CLIENT		

COMMONWEALTH EDISON COMPANY
WASTE WATER TREATMENT FACILITIES - WAUKEGAN
METAL CLEANING WASTE SYSTEM
PIPING & INSTRUMENTATION DIAGRAM
DRAWING NO. 5082ME3005
SHEET 2 OF 4
REV. 9
SCALE: NONE
ROCKVILLE MD.

83-9

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5082ME3005

REVISIONS	
REV	DESCRIPTION
1	APPROVED FOR CONSTRUCTION 7-27-78

EQUIPMENT SPECIFICATION LIST, SEE DWG ME-3005-1

16MC-101-FA
SLUDGE DEWATERING FILTER 'A'
TYPE: CONTINUOUS ROTARY VACUUM
SIZE: 8' DIA x 12' FACE WIDTH
CAP: 3000 LBS/HR (DRY SOLIDS)
MAT'L: C.S. EPOXY COATED
TOTAL WEIGHT: 25,000 LBS

FILTRATE PUMP
CAP: 75 GPM @ 50' FT. TDH
MOTOR: 3 HP
MAT'L: C.I.

VACUUM PUMP
CAP: 1330 ACFM @ 20" H_g VACUUM
MOTOR: 75 HP
MAT'L: C.I.

16MC-110-T
SLUDGE EQUALIZATION TANK
SIZE: 10'ϕ x 10'-(4) 12" BAFFLES
CAP.: 4700 GALLONS
MAT'L: C.S. EPOXY COATED

16MC-104-L
SLUDGE EQUALIZATION TANK MIXER
TYPE: TURBINE
SPEED: 56 RPM
MOTOR: 1.5 HP
MAT'L: C.S.

16MC-101-FB
SLUDGE DEWATERING FILTER 'B'
TYPE: CONTINUOUS ROTARY VACUUM
SIZE: 8' DIA x 12' FACE WIDTH
CAP: 3000 LBS/HR (DRY SOLIDS)
MAT'L: C.S. EPOXY COATED
TOTAL WEIGHT: 25,000 LBS

FILTRATE PUMP
CAP: 75 GPM @ 50 TDH
MOTOR: 3 HP
MAT'L: C.I.

VACUUM PUMP
CAP: 1330 ACFM @ 20 H_g VACUUM
MOTOR: 75 HP
MAT'L: C.I.

16MC-108-S
DRAG CHAIN TYPE SLUDGE CONVEYOR
CAPACITY: 28 TPD
WIDTH: 18 INCHES
MAT'L: C.S.

SEAL WATER FROM UTILITY DIST DIAGRAM DWG. ME-3025-1 (D-4)

BOX AREA INDICATES VACUUM FILTER PKG.

TO FLOOR DRAIN

WASH WATER FROM UTILITY DIST. DIAGRAM DWG ME 3025-1 (C-4)

TO CLARIFIER DWG ME3003-4 (E-3)

TO FLASH MIX TANK DWG ME3003-4 (E-3)

DRAIN FROM VACUUM PUMP SILENCER (C-2)

FROM FLOOR TRENCH DWG. ME3001-4 (A-2)

DRAIN FROM VACUUM FILTER 'B' (C-4)

TO FLOOR TRENCH (C-4)

TO FLASH MIX TK. DWG. ME3005-4 (D-4)

SULFURIC ACID FLOW DWG ME-3003-4 (C-4)

FROM BOT. TK WASH DWG ME-3003-4 (C-4)

FOR PLANT AIR DISTR. SEE DWG ME3025-3

FOR INSTR. AIR DIST. SEE ME3025-2

FOR INSTR. AIR DIST. SEE DWG ME 3025-2

SEAL WATER FROM UTILITY DIST. DIAG. DWG. ME3025-1 (D-4)

BOXED AREA INDICATES VACUUM FILTER AREA

WASH WATER FROM UTILITY DIST. DIAG. DWG. ME-3025-1 (D-3)

TO FLOOR DRAIN DWG. ME3005-5 (C-7)

NOTE: ONLY ONE CONVEYOR FOR BOTH FILTERS

CAKE DISPOSAL OFF-SITE

TO FLASH MIX TANK DWG ME-3005-4 (D-2)

FROM FLASH MIX TANK FLOW ELEMENT DWG. ME3005-4

SLUDGE FROM ELGIN/DON CLARIFIERS DWG ME 3003-4 (E-3)

TO BOTTOM ASH CLARIFIER OVERFLOW SUMP DWG ME3003-4

SLUICE GATE

16MC-104-N
COLLECTION DRAIN SUMP
SIZE: 21'-0" L x 8'-4" W x 13'-6" D
WORKING VOL: 6500 GALS
MAT'L: EPOXY COATED CONCRETE

16MC-113-PA/B
(2) COLLECTION DRAIN SUMP PUMPS
TYPE: CENTRIFUGAL VERTICAL
CAP EACH: 160 GPM @ 34 FT. TDH
MOTOR: 3 HP
MAT'L: C.I.

16MC-103-L
OVERFLOW SUMP MIXER
TYPE: 4 BLADE TURBINE
SPEED: 56 RPM
MOTOR: 2 HP
MAT'L: RUBBER COVERED C.S.

16MC-105-N
CLARIFIER OVERFLOW SUMP
NEUTRALIZATION COMPARTMENT
SIZE: 10'-0" L x 10'-0" W x 17'-0" D
WORKING VOL: 7500 GALS
MAT'L: EPOXY COATED CONCRETE
PUMPING COMPARTMENT (SERVICE WATER SUMP)
SIZE: 10'-0" L x 10'-0" W x 17'0 D
WORKING VOL: 5200 GALS
MAT'L: CONCRETE

BOTTOM ASH O/F SUMP DWG. ME 3003-4 (B-3)

16MC-106-N
CLARIFIER UNDERFLOW SUMP
SIZE: 8'-0" L x 8'-0" W x 21' DP
WORKING VOL: 5500 GALS
MAT'L: EPOXY COATED CONCRETE

16MC-114-PA/B
(2) UNDERFLOW SUMP PUMPS
TYPE: PLUNGER
CAP EACH: 300 GPM @ ± 87 TDH
MOTOR: 15 HP
MAT'L: C.I.

16MC-107-L
SLUDGE EDUCTOR
NOZZLE SIZE: 3/4"
MAT'L: C.I.

BOTTOM ASH SYSTEM UNDERFLOW SUMP DWG. ME3003-4 (B-6)

16MC-125-T
ALUM STORAGE TANK
VOL: 5000 GALS
SIZE: 10'ϕ x 10' H
MAT'L: RUBBER LINED STEEL

16MC-158-PA&B
ALUM FEED PUMPS
0-36 GPH
DISCHARGE PRESSURE: 25 PSIG
MAT'L: TEFLON DIAPHRAGM
KYNAR HEAD
H.P.: 1/4

NOTES:
① FOR PIPE SPEC. SEE DWG. ME-3003-4 NOTE 3.

APPROVED FOR CONSTRUCTION

COMMONWEALTH EDISON COMPANY
WASTEWATER TREATMENT FACILITIES-WAUKEGAN
METAL CLEANING WASTE SYSTEM
PIPING & INSTRUMENTATION DIAGRAM

5082ME3005

23-10

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5082ME3006

DISCHARGE TUNNELS BLOCKED

DISCHARGE AREA RUN-OFF DWG. ME3008-2(D-7)

RYW-Y.Co.

OUTSIDE YARD BILGE SUMP (DWG. ME3006-4)

FDW-12"-104-088

FLOOR DRAIN SEPARATOR EFFLUENT DWG. ME3006-3(C-8)

EXIST. CROSS CONNECTION

SLUICE GATE HOUSING - TYP 3 PLACES

OUTSIDE DUCT

INSIDE DUCT

UNITS 1 & 2 DISCHARGE TUNNEL, 9'-0" WIDE X 6'-0" HIGH, INSIDE BOTTOM EL. -7'-0"

UNITS 3 & 4 DISCHARGE TUNNEL, 9'-6" WIDE X 10'-0" HIGH, INSIDE BOTTOM EL. -10'-0"

UNIT 1 FLOOR DRAINS

UNIT 2 FLOOR DRAINS

UNIT 3 FLOOR DRAINS

UNIT 4 FLOOR DRAINS

(1) UNIT 1 CONDENSER PIT - FLOOR AND EQUIPMENT DRAINS

(2) UNIT 2 CONDENSER PIT - FLOOR AND EQUIPMENT DRAINS

(3) UNIT 3 CONDENSER PIT - FLOOR AND EQUIPMENT DRAINS

(4) UNIT 4 CONDENSER PIT - FLOOR AND EQUIPMENT DRAINS

UNIT 1 EXIST COND. SUMP PUMPS
CAP EACH: 250 GPM @ 13 FT. TDH
MAT'L: C.S. 5 HP

UNIT 1 EXIST COND. SUMP PIT
CAP: 1200 GALS.
SIZE: 4'-8" X 5'-9" X 5'-10" DP.

UNIT 2 EXIST COND. SUMP PUMPS
CAP EACH: 250 GPM @ 13 FT. TDH
MAT'L: C.S. 5 HP

UNIT 2 EXIST COND. SUMP PIT
CAP: 1,350 GALS.
SIZE: 5'-0" X 5'-10" X 6'-3" DP.

UNIT 3 EXIST. COND. SUMP PUMPS
CAP EACH: 250 GPM @ 25 FT. TDH
MAT'L: C.S. 5 HP

UNIT 3 EXIST. COND. SUMP PIT
CAP: 2,050 GALS.
SIZE: 5'-3" X 6'-0" X 8'-8" DP.

UNIT 4 EXIST. COND. SUMP PUMPS
CAP EACH: 250 GPM @ 25 FT. TDH
MAT'L: C.S. 5 HP

UNIT 4 EXIST. COND. SUMP PIT
CAP: 1,925 GALS
MAT'L: 5'-3" X 6'-0" X 8'-2" DP.

ALTERNATOR

FDW-6"-201-677

FDW-6"-201-676

16FD-152-PA

16FD-152-PB

FDW-4"-202

FDW-4"-203

16FD-152-PA/B
UNIT 5 & 6 CRIB HOUSE SUMP PUMPS
CAP. EACH: 255 GPM @ 63 FT. TDH
MAT'L.: C.S. 7½ HP

UNIT 5 & 6 EXIST. CRIB HOUSE SUMP PIT
CAP: 1600 GALS.
SIZE: 5'-4" X 7'-4" X 5'-6" DP.

(5) UNIT 5 & 6 CRIB HOUSE FLOOR & EQUIPMENT DRAINS

FDW-6"-201-681

SOUTH PLANT FLOOR & EQUIPMENT DRAIN HEADER DWG. ME3006-2(D-6)

FDW-14"-201-076

FLOOR & EQUIPMENT DRAIN HEADER TO SURGE TANK DWG ME 3006-3 (D-7)

FDW-6"-201-680

FDW-6"-201-679

16FD-148-PA

16FD-148-PB

FDW-4"-201

16FD-148-PA/B
UNIT 5 COND. SUMP PUMP
CAP EACH: 450 GPM @ 56 FT. TDH
MAT'L: C.S. 10 H.P.

UNIT 5 EXIST COND. SUMP PIT
CAP: 2,350 GALS.
SIZE: 5'-2" X 7'-0" X 8'-8" DP.

(6) UNIT 5 CONDENSER PIT FLOOR & EQUIPMENT ROOM & TURBINE RM. DRAINS

(12) UNIT 5 BOILER ROOM FLOOR & EQUIPMENT DRAINS

FDW-4"-201-683

FDW-4"-201-682

16FD-154-PA

16FD-154-PB

16FD-154-PA/B
UNIT 5 BOILER ROOM SUMP PUMPS
CAP.: 100 GPM @ 25 FT. TDH
MAT'L.: C.S. 2 HP

16FD-113-N
UNIT 5 BOILER ROOM SUMP PIT
CAP.: 2875 GALS.
SIZE: 6'-0" X 4'-6" X 6'-0" DP.
MAT'L.: CONCRETE

EQUIP. TAG NO.	STANDARD / SPEC. NO.	M.E.P.R. NO.	SHT. NO.
16FD-103-D	MP137	442	3
16FD-111-T	MP158	772	3
16FD-112-T	MP158	772	3
16FD-113-N	5082P179		1
16FD-115-P	MP137	442	3
16FD-117-P	MP137	442	3
16FD-118-P	MP146		3
16FD-125-N	5082P179		2
16FD-137-PA	MP154		1
16FD-137-PB			1
16FD-148-PA			1
16FD-148-PB			1
16FD-149-PA			2
16FD-149-PB			2
16FD-150-PA			2
16FD-150-PB			2
16FD-151-PA			2
16FD-151-PB			2
16FD-152-PA			1
16FD-152-PB			1
16FD-153-PA			1
16FD-154-PB			1
16FD-155-PA			2
16FD-155-PB			2
16FD-156-PA			2
16FD-156-PB			2
16FD-157-PA			2
16FD-157-PB			2
16FD-147-PA			2
16FD-147-PB			2
16FD-153-PA			2
16FD-153-PB			2
16FD-112-N	5082P179		2

REVISIONS	
REV	DESCRIPTION
1	APPROVED FOR CONSTRUCTION 7-27-78

APPROVED FOR CONSTRUCTION

COMMONWEALTH EDISON COMPANY
WASTE WATER TREATMENT FACILITIES-WAUKEGAN
BUILDING PLUMBING & FLOOR DRAINS PIPING & INSTRUMENTATION DIAGRAM

NUS CORPORATION ROCKVILLE MD.

DRAWING NO. 5082ME3006 REV 1

SHEET 1 OF 5

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5082ME3006 1

REVISIONS	
REV	DESCRIPTION
1	APPROVED FOR CONSTRUCTION 7-27-76 GPF

EQUIPMENT SPECIFICATION LIST - SEE DWG. ME 3006-1

EXISTING EQUIPMENT DRAINS FROM BLR. 17 & ANALYZER RECIRC. DRAIN PUMPS A & B.

PLATFORM EL. 133'-0"

FDW-1"-201-696

E 201 (102)

FDW-4"-201-711

201 E (101)

ALT

LS 127C

PI 127A

FT 127A

FT 127B

M

FDW-3"-201

FDW-6"-201-710

FDW-6"-201-709

16FD-155-PA 16FD-155-PB

16FD-155-PA/B
UNIT 6 BOILER ROOM SUMP PUMPS
CAP EACH: 250 GPM @ 41 FT. TDH
MAT'L: C.S. 5 HP

UNIT 6 EXIST. BOILER RM. SUMP PIT
CAP: 3435 GALS
SIZE: 8'-3" X 2'-3" X 10'-8" DP.

UNIT 6 BOILER ROOM FLOOR DRAINS (12)

SOUTH PLANT FLOOR EQUIPMENT DRAIN HEADER DWG. ME 3006-1 (D-2)

FDW-14"-201-076

201 (97) 10" FDW-10"-201-076

201 (96) 1" CAP

10" FDW-8"-201-076

201 E (93) FDW-10"-201-076

FDW-6"-201-695

FDW-4"-201-689

FDW-4"-201-692

FDW-4"-201-076

CD

ALT

LS 125C

PI 125A

PI 125B

M

FDW-4"-201-688

FDW-4"-201-687

16FD-157-PA 16FD-157-PB

UNIT 8 BOILER ROOM FLOOR DRAINS (16)

16FD-157-PA/B
UNIT 8 BOILER ROOM SUMP PUMPS
CAP EACH: 250 GPM @ 46 FT. TDH.
MAT'L: C.S. 5 H.P.

16FD-125-N
UNIT 8 BOILER ROOM SUMP PIT
CAP: 1200 GALS.
SIZE: 4'-0" X 8'-0" X 4'-0" DP.

FDW-4"-201-691

FDW-4"-201-690

16FD-153-PA 16FD-153-PB

UNIT 8 PULVERIZER AREA FLOOR & EQUIPMENT DRAINS (17)

16FD-153-PA/B
UNIT 8 PULVERIZER AREA SUMP PUMPS
CAP EACH: 100 GPM @ 41 FT. TDH
MAT'L: C.S. 2 H.P.

16FD-112-N
UNIT 8 PULVERIZER AREA SUMP PIT
CAP: 500 GALS.
SIZE: 4'-0" X 4'-0" X 4'-0" DP.

FDW-4"-201-708

FDW-4"-201-707

FDW-4"-201-706

16FD-147-PA 16FD-147-PB

UNITS 5 & 6 OIL STORAGE AREA EXIST. SUMP PIT
CAP.: 450 GALS.
SIZE: 3'X5'X4' DP.

TURBINE OIL STORAGE ROOM DRAINS (15)

16FD-147-PA/B
UNITS 5 & 6 TURBINE OIL STORAGE AREA SUMP PUMPS
CAP EACH: 250 GPM @ 45 FT. TDH
MAT'L.: C.S., 5 HP

UNITS 5 & 6 TURBINE STORAGE AREA SUMP PIT
CAP: 600 GALS.
SIZE: 3'-0" X 5'-0" X 4'-0" DP.

FDW-6"-201-705

FDW-4"-201-704

FDW-4"-201-703

FDW-6"-201-702

FDW-6"-201-701

16FD-149-PA 16FD-149-PB

UNIT 6 CONDENSER PIT DEBASSER BILGE & TURBINE ROOM DRAINS (7)

16FD-149-PA/B
UNIT 6 COND. PUMPS
CAP EACH: 250 GPM @ 41 FT. TDH
MAT'L: C.S. 5 HP

UNIT 6 EXIST COND. SUMP PIT
CAP: 6120 GALS
SIZE: 7'-8" X 10'-8" X 10'-8" DP.

FDW-6"-201-699

FDW-4"-201-700

16FD-150-PA 16FD-150-PB

UNIT 7 TURBINE ROOM SILGE - AUX. SWITCH GEAR & EQUIPMENT DRAINS (8)

16FD-150-PA/B
UNIT 7 TURBINE RM. SUMP PUMPS
CAP EACH: 150 GPM @ 39 FT. TDH
MAT'L: C.S. 2 HP

UNIT 7 EXIST. TURBINE RM. SUMP PIT
CAP: 1436 GALS.
SIZE: 4'-0" X 6'-0" X 8'-0" DP.

FDW-6"-201-698

FDW-4"-201-699

FDW-4"-201-697

16FD-156-PA 16FD-156-PB

UNIT 7 & 8 CRIB WATER TURBINE & EQUIPMENT DRAINS (14)

16FD-156-PA/B
UNIT 7 & 8 CRIB WATER SUMP PUMPS
CAP EACH: 350 GPM @ 42 FT. TDH
MAT'L: C.S. 5 HP

UNIT 7 & 8 EXIST. CRIB WATER SUMP PIT
CAP: 32,720 GALS.
SIZE: 21'-0" X 24'-0" X 10'-0" DP.

FDW-6"-201-694

FDW-6"-201-693

FDW-4"-201-695

16FD-151-PA 16FD-151-PB

UNIT 8 CIRCULATING WATER PUMPS (9)

16FD-151-PA/B
UNIT 8 CIRCULATING WATER SUMP PUMPS
CAP EACH: 350 GPM @ 66 FT. TDH
MAT'L: C.S. 10 HP

UNIT 8 EXIST CIRCULATING WATER SUMP PIT
CAP: 565 GALS.
SIZE: 4'-0" X 8'-0" X 6'-0" DP.

APPROVED FOR CONSTRUCTION

COMMONWEALTH EDISON COMPANY
WASTE WATER TREATMENT FACILITIES-WAUKEGAN
BUILDING PLUMBING & FLOOR DRAINS PIPING & INSTRUMENTATION DIAGRAM

NUS CORPORATION ROCKVILLE MD

DRAWING NO. 5082ME3006 REV 1

SCALE NONE SHEET 2 OF 15

93-12

07580000090

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Electronic Filing: Received, Clerk's Office 10/31/2022

5082ME3006

REVISIONS		
REV	DESCRIPTION	
1	APPROVED FOR CONSTRUCTION	7-27-78

PARTS LIST				
NO. ITEM	DESCRIPTION	REQ'D	IDENTIFICATION MATERIAL	PART NO. OR SPECIFICATION

EQUIPMENT SPECIFICATION LIST - SEE DWG. ME 3006-1

16 FD-111-T
FLOOR DRAIN SURGE TANK
CAP.: 10,000 GAL., 12'ø X 15'H
MAT'L: C.S.

16 FD-112-T
WASTE OIL SLUDGE TANK
CAP.: 10000 GALLONS
SIZE: 12'ø X 15'H
MAT'L: C.S.

16 FED-105-D
OIL SEPARATOR
CAP.: 500 GPM
MAT'L: SHELL - CARBON STEEL
CORRUGATED PLATES - FRP

VACUUM PUMPS
CAP. EACH: 10 CFM @ 11" HG
MOTOR HP: 1

OIL RECEIVING TANK
CAP. 275 GALLONS
SIZE: 2'-6"ø X 3'-1"H
MAT'L: C.S.

OIL/SLUDGE REMOVAL PUMPS
CAP EACH: 20 GPM @ 92' TDH
MAT'L: HOUSING - C.I.
ROTOR - 416 S.S.
STATOR - BUNAN
MOTOR H.P.: 1½

16 FD-115-P
WASTE OIL SLUDGE PUMP
CAP.: 50 GPM @ 13.43' TDH
MAT'L: HOUSING - C.I.
ROTOR - 416 S.S.
STATOR - BUNAN
MOTOR H.P.:

TO TANK TRUCK
OIL TO BE HAULED
OFF SITE

TO UNITS 3 & 4
DISCHARGE TUNNEL
DWG. ME 3006-1 (D-4)

SLOPE

SUPPLIED WITH THE EQUIPMENT BY VENDOR

APPROVED FOR CONSTRUCTION

COMMONWEALTH EDISON COMPANY
WASTEWATER TREATMENT FACILITIES - WAUKEGAN
BUILDING PLUMBING & FLOOR DRAINS
PIPING & INSTRUMENTATION DIAGRAM

NUS CORPORATION, ROCKVILLE, MD
DRAWING NO. 5082ME3006

85-13

07580000091
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5082ME3006 Rev 3

UNIT 1 BOILER AREA ROOF DRAINS (2 DRAINS)
UNIT 1 TURBINE AREA ROOF DRAIN (1 DRAIN)
UNIT 2 TURBINE AREA ROOF DRAIN (1 DRAIN)
UNIT 2 BOILER AREA ROOF DRAINS (4 DRAINS)
EXISTING MANHOLE SYSTEM
TURBINE AREA ROOF DRAIN HEADER (THIS DWG.) A-3
RYW-14-201-843
UNITS 1 & 2 KINGPOLE
UNITS 1 & 2 DISCHARGE TUNNEL
UNIT 3 TURBINE AREA ROOF DRAIN (1 DRAIN)
UNIT 4 TURBINE AREA ROOF DRAIN (1 DRAIN)
UNIT 4 TURBINE AREA ROOF DRAIN (1 DRAIN)
UNIT 4 TURBINE AREA ROOF DRAINS (2 DRAINS)
UNIT 4 TURBINE AREA ROOF DRAINS (2 DRAINS)
UNIT 3 & 4 BOILER AREA ROOF DRAINS (2 DRAINS)
UNIT 4 BOILER AREA ROOF DRAINS (2 DRAINS)
UNITS 3 & 4 DISCHARGE TUNNEL
LAN 938 LAL 939
HS 327 HS 328 HS 329
RYW-14-201-851
RYW-14-201-850
RYW-14-201-849
24X14" RED
P1 211A P1 211B P1 211C
LTS 135 LS 135 AUX
+6.0'
+4.8'
RYW-24-201-713
TRENCH TO EAST YARD RUNOFF BASIN (IGRY-109-N)
STANDBY
IGFD-131-PA,B,C
OUTSIDE YARD BILGE SUMP PUMPS
CAP. EACH: 3500 GPM
TDH: 21 FT.
MOTOR: 30 H.P.
ONE OR TWO PUMPS OPERATING
ONE STANDBY
RYW-24"-201-844
RYW-18"-201-834
UNIT 7 EAST BOILER AREA & PRES. P CONTROL RM ROOF DRAINS (3 DRAINS) COL. (A-29)
MACHINE SHOP ROOF DRAINS (2 DRAINS) COL. (L-23A)
UNIT 5 EAST BOILER AREA ROOF DRAIN (1 DRAIN) COL. (Q-21)
RYW-10"-201-833
RYW-10"-201-834
UNIT 5 WEST BOILER AREA & COAL SILO ROOF DRAINS (5 DRAINS) COL. (E-31)
UNIT 5 EAST TURBINE AREA ROOF DRAINS (7 DRAINS) COL. (D-33)
UNIT 5 SOUTH BOILER AREA ROOF DRAINS (2 DRAINS) COL. (F-32)
UNIT 5 EAST BOILER AREA ROOF DRAINS (4 DRAINS) COL. (K-36)
UNIT 7 WEST BOILER & ALL TURBINE AREA ROOF DRAINS (29 DRAINS) COL. (E-39)
UNIT 6 BOILER AREA & COAL SILO AREA & EAST TURBINE AREA ROOF DRAINS (9 DRAINS) COL. (K-23)
UNIT 6 BOILER AREA & EAST TURBINE AREA ROOF DRAINS (7 DRAINS) COL. (D-22)
RYW-12"-201-827
RYW-8"-201-823
RYW-6"-201-824
RYW-8"-201-825
RYW-10"-201-830
RYW-8"-201-830
RYW-10"-201-831
RYW-10"-201-832
RYW-12"-201-833
RYW-16"-201-828
RYW-16"-201-829
RYW-20"-201-848
RYW-6"-201-845
RYW-6"-201-842
RYW-8"-201-843
RYW-6"-201-846
RYW-6"-201-847
RYW-10"-201-840
RYW-12"-201-841
RYW-12"-201-839
UNIT 3 WEST TURBINE AREA ROOF DRAIN (1 DRAIN) COL. (A-2)
UNIT 2 NORTH WEST TURBINE AREA ROOF DRAINS (1 DRAIN) COL. (A-5)
UNIT 2 SOUTH WEST TURBINE AREA ROOF DRAIN (1 DRAIN) COL. (A-3)
UNIT 3 WEST TURBINE AREA ROOF DRAIN (1 DRAIN) COL. (A-3)
UNIT 4 SOUTH WEST TURBINE AREA ROOF DRAIN (1 DRAIN) COL. (A-3)
UNIT 4 WEST TURBINE AREA ROOF DRAIN (1 DRAIN) COL. (A-3)
UNIT 4 SOUTH WEST TURBINE AREA ROOF DRAIN (1 DRAIN) COL. (A-3)
RYW-6"-201-835
RYW-6"-201-836
RYW-6"-201-837
RYW-8"-201-838
RYW-6"-201-839
RYW-6"-201-840
RYW-12"-201-841
RYW-14"-201-842
TURBINE AREA ROOF DRAIN HEADER TO UNITS 1 & 2 KING POLE (THIS DWG.) D-5
C.O.

REVISIONS

REV	DESCRIPTION
1	APPROVED FOR CONSTRUCTION 7-27-78
2	ADDED CHECK VALVES & BILGE SUMP. REVISIONS PER CODE & ADDED TIE-IN NOS. CHKD. APP'D. COG ENGR. NECH ENGR. ELECT. ENGR. PROJ. ENGR. 12-7-78
3	REV'D. PIPING SPEC. & GEN. REVS. CHKD. COG. ENGR. MECH. ENGR. ELECT ENGR. PROJ. ENGR. 20 FEB 79

APPROVED FOR CONSTRUCTION
SB Geiger 7/26/78

07580000092
MICROFILM

COMMONWEALTH EDISON COMPANY
WASTEWATER TREATMENT FACILITIES-WAUKEGAN
ROOF DRAINS
PIPING & INSTRUMENTATION DIAGRAM
DESIGNED BY 802670
NUS CORPORATION ROCKVILLE, MD
DRAWING NO. 5082ME3006
SCALE NONE

Electronic Filing: Received, Clerk's Office 10/31/2022

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5082ME3007 2

EQUIP TAG No.	STANDARD/SPEC No.	M.E.P.R. No.	SHT. No.
1GHQ-119-T	MP159	454	2
1GHQ-120-T	MP159	454	3
1GHQ-121-T	MP159	454	4
1GHQ-132-PAEB	MP164	926	2
1GHQ-132-PAEB	MP164	926	3
1GHQ-132-PAEB	MP164	926	4
1GHQ-112-F	5082 P179	650	2
1GHQ-112-F	5082 P179	650	3
1GHQ-112-F	5082 P179	650	4

REV	DESCRIPTION
1	APPROVED FOR CONSTRUCTION 7-27-78
2	DELETED NOTE 4, LINE HQW-3"-300-852. ADDED NOTE 8 AND P.P. WHERE APPLICABLE ALSO GEN. REV'S 4 ME, PP NO'S. DRFTS. CRT CHECKER COG. ENGR. ELECT. ENGR. CIVIL ENGR. MECH. MGR. RE. 36620 PROJ. MGR. 4-8-79

GENERAL NOTES:

1. VALVE TO BE OPENED ONLY FOR EMERGENCY DUMP (FOR DRUM LEVEL CONTROL)
2. ▭ INTERLOCK FAILURE ALARM
3. INLET VALVE SET TO FLASH TANK DESIGN FLOW AND LOCKED IN POSITION IN FIELD
4. DELETED
5. HAND SWITCHES 429, 428 A & B, PANEL SWITCHES 282 A & B, ANNUNCIATORS 844, 923 & 924 AND POSITION LIGHT 845 DESIGNATED 17 C.P. INDICATE THESE ITEMS LOCATED ON THE BOILER GAGE BOARD 17.
6. 5082ME3007-1 VOIDED
7. WATER TRAPPED IN PIPE LINE AFTER BOILER DRAINING OPERATION HAS BEEN COMPLETED MUST BE DRAINED VIA FLEX HOSE TO ASH PIT
8. FOR EQUIPMENT AND PIPING PERSONNEL PROTECTION INSULATION SEE DWG 5082ME3206 SHT. 182

BOILER 17 STEAM DRUM

BOILER 17 MUD DRUM

HQW-1"-700-582

HQW-1½"-700-582

TO SAMPLE COOLER

HQW-2"-700-586

HQW-1"-700-585

HQW-2"-700-584

HQW-1"-700-583

HQW-2½"-700-584

FROM EXIST. STEAM DRUM B/D

HQW-2½"-700-586

HQW-4"-700-587

HQW-4"-700-589

EXISTING 10" FLOOR DRAIN HEADER TO UNIT 6 KINGHOLE

FROM ECONOMIZER AND FROM PRIMARY & SECONDARY SUPER HEATER INLET & OUTLET HEADERS (6 LINES)

FROM EXIST. MUD DRUM B/D

FROM EXIST. MUD DRUM B/D

SEE NOTE (1)

UNIT 6 KINGHOLE

BLOCKED-OFF

EXIST. UNIT 6 FLOOR TRENCH

NEW TRENCH

TO UNIT #6 BOILER R-A SUMP DWG. ME 3006

EMERGENCY OVERFLOW

HQW-2½"-700-591

HQW-4"-700-588

HQW-4"-700-592

HQW-1"-201

DRAIN TO FL. TRENCH

1GHQ-112-F EXHAUST HEAD (VENT TO ATMOSPHERE)

HQT-20"-201-594

HQW-3"-201-595

ROOF VENT

EL. 40' APPROX.

HQW-2-201

LOOP SEAL SELF FILL

HQW-3"-201

HQT-12"-201-594

HQT-1"-201-591

HQW-4"-201-596

HQT-1½"-201

HQW-4-201-593

HQW-4"-201-536

HQW-2½"-700-591

1GHQ-119-T UNIT 6 FLASH TANK CAP: 50,000 LBS/HR SIZE: 7'ϕ x 9'H CODE: ASME W/STAMP DESIGN PRESS.: 110 PSIG, T=250°F OPER. PRESS.: ATM.

ROUTE DRAIN TO FLOOR

INTERLOCK

NOTE (2)

TO BOILER PRESSURE GAGE TAP (EXIST.)

1GHQ-132-PA&B UNIT 6 FLASH TANK DRAIN PUMPS CAP. EACH: 100 GPM @ 27.5 FT TDH, MOTOR: 2 H.P. ONE OPER., ONE STANDBY PUMP IN SU. (NOTE 8)

1GHQ-132-PA

1GHQ-132-PB

HQW-2½"-201-598

HQW-2½"-501-599

HQW-2½"-201-751

HQW-2½"-501-752

TO MAIN COLLECTION TANK DWG. ME 3007-4(D-2)

0758000009'3

MICROFILM

APPROVED FOR CONSTRUCTION

COMMONWEALTH EDISON COMPANY
WASTE WATER TREATMENT FACILITIES-WAUKEGAN
HIGH QUALITY BOILER WATER REUSE SYSTEM
PIPING & INSTRUMENTATION DIAGRAM

NUS CORPORATION ROCKVILLE MD

5082ME3007 2

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5082ME3007 2

BOILER 7 STEAM DRUM

EQUIPMENT SPECIFICATIONS - SEE DWG. ME3007-2

PARTS LIST					
ITEM	DESCRIPTION	REQ'D	IDENTIFICATION	MATERIAL	PART NO. OR SPECIFICATION

REVISIONS	
REV	DESCRIPTION
1	APPROVED FOR CONSTRUCTION 7-27-78
2	DELETED LINE HQW-1"-800-649 ADDED P.P. WHERE APPLICABLE AND GEN. REVS. DRFTS. CHK'D CHECKER APP'D COG. ENGR. ELECT. ENGR. CIVIL ENGR. MECH. MGR. PROJ. MGR. 8-8-79

DRAINS FROM SUPERHEATER AND REHEATER HEADERS

TO SAMPLE COOLER

HQW-1"-800-600

CAP EXISTING MUD DRUM REHEAT FURNACE EAST B/D LINES

CAP EXISTING MUD DRUM REHEAT FURNACE WEST B/D LINES

MUD DRUM (EAST)

BOILER 7 REHEAT FURNACE

MUD DRUM (WEST)

MUD DRUM (EAST)

BOILER 7 SUPERHEAT FURNACE

MUD DRUM (WEST)

CAP EXISTING MUD DRUM SUPERHEATER FURNACE WEST B/D LINES

CAP EXISTING MUD DRUM SUPERHEATER FURNACE EAST B/D LINES

NOTES: SEE DWG. ME3007-2

CONTROL LOCATION NOTE:
HANDSWITCHES 44A, 430A&B, POSITION LIGHT 848, ANNUNCIATORS 515, 516 & 847 AND PANEL SWITCHES 286A&B, DESIGNATED "U7" INDICATES THESE ITEMS LOCATED ON THE UNIT 7 STATION CONTROL PANEL.

ACID WASH CONN. (EXIST.)

HQW-1"-800-620

HQW-1"-800-649

HQW-2"-800-603

HQW-2"-800-604

HQW-2"-800-602

HQW-2"-800-605

HQW-2"-800-606

HQW-2"-800-610

HQW-1½"-800-601

HQW-2"-800-607

HQW-2"-800-608

HQW-4"-800-563

HQW-4"-800-563

HQW-4"-800-611

INTERLOCK

TO BOILER PRESSURE GAGE TAP (EXIST)

HQW-4"-501-672

TO MAIN COLLECTION TANK DWG. ME3007-4(D-3)

HQW-2½"-501-564

TO MAIN COLLECTION TANK DWG. ME3007-4(D-3)

SEE NOTE ①

16HQ-113-F
EXHAUST HEAD
(VENT TO ATMOSPHERE)

HQW-2"-201 VENT

HQT-20"-201-617

HQT-12"-201-617

ROOF

EL. 40' APPROX.

HQW-1"-201 SET @ 110 PSIG

LOOP SEAL

HQW-3"-201-618

HQW-4"-201-619

HQT-12"-201

HQW-4"-201-615

HQW-6"-201-763

HQW-2½"-501-728

HQW-2½"-201-613

HQW-2½"-201-760

HQW-2½"-501-761

HQW-4"-501-616

HQW-1"-201

HQW-6"-201-759

HQW-6"-201-759

HQW-2"-201-760

16HQ-120-T
UNIT 7 FLASH TANK
CAP: 50000 lbs/HR
SIZE: 7'DIA. x 9'H.
CODE: ASME W/STAMP
DESIGN PRESS.: 110 PSIG, T=250°
OPER. PRESS.: ATM.

ROUTE DRAIN TO FLOOR

16HQ-133-PA

16HQ-133-PB

HQT-4"-201-671

HQW-4"-201-619
EMERGENCY OVERFLOW

16HQ-193-PA&B
UNIT 7 FLASH TANK DRAIN PUMPS
CAP. EA.: 100 GPM @ 30 FT. TDH.
ONE OPERATING, ONE STANDBY.
MOTOR: 2 HP
PUMP INSAL. (NOTE ⑤)

UNIT 7 KINGHOLE

TO UNIT 6 EMERGENCY O/F DWG. ME3007-4(A5)

EXIST. UNIT #6 B/A TRENCH

07580000094
MICROFILM

APPROVED FOR CONSTRUCTION

COMMONWEALTH EDISON COMPANY
WASTE WATER TREATMENT FACILITIES-WAUKEGAN
HIGH QUALITY BOILER WATER REUSE SYSTEM
PIPING & INSTRUMENTATION DIAGRAM

CECO CONTRACT 802670 | CECO DWG. NO. 5082ME3007 | REV. 2

NUS CORPORATION ROCKVILLE, MD. | SCALE NONE | SHEET 3 OF 4

83-76-C

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5082ME3007 2

BOILER 8 STEAM DRUM

HQW-½"-800-G21

HQW-½"-800-G23

HQW-1½"-800-G24

HQW-1½"-800-G22

HQW-1½"-800-G22

1½"

P.P.

DRAINS FROM SUPERHEATER & REHEATER HEADERS

FROM EXIST. STM. DRUM BLOWDOWN

HQW-2"-800-G66

HQW-2"-800-G25

HQW-2"-800-G26

HQW-2"-800-G29

MUD DRUM (EAST)

BOILER 8 REHEAT FURNACE

MUD DRUM (WEST)

BOILER 8 SUPERHEAT FURNACE

HQW-4"-800-G35

HQW-4"-800-G36

HQW-2"-800-G38

HQW-2"-800-G39

HQW-2"-800-G40

HQW-2"-800-G27

HQW-2"-800-G28

HQW-4"-800-557

HQW-4"-800-641

HQW-4"-800-557

FLEX HOSE (SEE GENERAL NOTE 7)

TO BOILER PRESSURE GAGE TAP (EXIST.)

INTERLOCK

NOTE 2

HQW-4"-800-

HQW-2½"-800-631

SEE NOTE 1

HQ-114-F EXHAUST HEAD (VENT TO ATMOSPHERE)

HQT-20-201-636

HQT-12-201-636

HQW-3"-201-637

HQW-2"-201-

EL. 40' APPROX.

LOOP SEAL FILL

HQW-4"-201-634

HQT-1½"201

HQW-4"-201-633

HQT-4"-201-556

HQW-4"-800-641

HQW-4"-501-559

HQW-4"-501-632

HQW-2½"-501-558

HQW-2½"-501-767

HQW 2½"-201-635

HQW-2½"-501-766

HQW 2½"-201-765

HQW-3"-201-764

HQW-1"-201

HQW-6"-201-764

16HQ-121-T

UNIT 8 FLASH TANK

CAP: 50,000 lbs/HR

SIZE: 7'DIA. x 9'H

CODE: ASME, W/STAMP

DESIGN PRESS.: 1107 PSIG, 715°F

OPER PRESS.: ATM.

ROUTE DRAIN TO FLOOR

16HQ-134-PA

UNIT 8 KINGHOLE

16HQ-134-PA & B

UNIT 8 FLASH TANK DRAIN PUMPS

CAP. EACH: 100 GPM @ 31 FT. TDH

ONE OPERATING ONE STANDBY

MOTOR: 2 H.P.

PUMP INSUL. (NOTE 5)

UNIT 6 BOILER DRUM & FLASH TANK DISCH. HEADER DWG. ME3007-2 (A-2)

HQW 4"-501-588

HQW 6"-501-555

UNIT 7 BOILER DRAIN HEADER DWG. ME3007-3 (B-1)

HQW 4"-501-672

UNIT 7 FLASH TANK DISCH. HEADER DWG. ME3007-3 (B-1)

HQW 2½"-501-564

HQW 6"-501-555

HEADER DRAIN TO UNIT 8 ASH P.T. DWG ME3005-2 (B-7)

HQW 6"-501-530

TO MAIN COLLECTION TANK, BOTTOM ASH SYSTEM DWG. ME 3003-3 (E-7)

NOTES: SEE DWG. ME 3007-2

CONTROLS LOCATION NOTE: HANDSWITCHES 43Z, 43IA&B, PANEL SWITCHES 28EA&B, ALARMS 85D, 92T&92B, AND POSITION LIGHT 85J DESIGNATED "U7" INDICATES THESE ITEMS LOCATED ON UNIT 7 STATION PANEL.

EXIST BOT ASH FLOOR TRENCH

CAP EXIST. MUD DRUM B/D HEADERS

FROM UNIT 8 REHEAT FURNACE ECON. DRAINS

FROM UNIT 8 SUPERHEAT FURNACE ECON. DRAINS

FROM UNIT 7 EMERGENCY O/F DWG. ME 3007-3 (A-2)

HQW-4"-201-619

EXIST 6" ROOF DR (ABANDONED)

HQW-6"-201-638 EMERGENCY O/F

UNIT 8 DISCH CANAL

EQUIPMENT SPECIFICATIONS - SEE DWG. ME3007-2

PARTS LIST

REQ'D SITE	DESCRIPTION	REQ'D	IDENTIFICATION MATERIAL	IDENTIFICATION PART NO. OR SPECIFICATION

REVISIONS

REV	DESCRIPTION
1	APPROVED FOR CONSTRUCTION 7-27-78
2	DELETED LINE HQW-1"-800-853 ADDED P.P. WHERE APPLICABLE & GEN. REV'S. DRFTS. CHKD CHECKER CDG. ENGR. ELECT. ENGR. CIVIL ENGR. MECH. MGR. P.E. 36420 PROJ. MGR. 7-8-78

07580000095

MICROFILM

APPROVED FOR CONSTRUCTION

COMMONWEALTH EDISON COMPANY
WASTE WATER TREATMENT FACILITIES-WAUKEGAN
HIGH QUALITY BOILER WATER REUSE SYSTEM
PIPING & INSTRUMENTATION DIAGRAM

CECO CONTRACT 80267C

NUS CORPORATION ROCKVILLE, MD

5082ME3007

SCALE NONE

SHEET 4 OF 5

83-17

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5082ME3008 1

16CR-127-N
MAIN COLLECTION TANK AREA SUMP:
CAP: 3600 GALLONS
SUMP DIMS: 7.5'L X 13'W X 12.5'DEEP
EFFECTIVE SUMP DEPTH: 5'
MATL: CONCRETE

16CR-106-PA/B/C
MAIN COLLECTION TANK AREA SUMP-PUMPS
CAP: EACH 600 GPM @ 14 FEET TDH
MATL: C.I.
MOTOR HP:

16CR-102-S
PACKAGED POLYMER FEED SYSTEM
MIX TANK-100 GALLONS
AGING TANK-500 GALLONS
TWO METERING PUMPS EACH: 3 GPM
MIXING MOTOR-3/4 HP
CONC. AT PUMPING: 2500 MG/L
CONC. AFTER DILUTION: 10.0 MG/L

16CR-109-S
AUTO BACKWASH PREFILTER/COALESCER PACKAGE
CAP: 600 GPM
PRE FILTER UNIT: NO. OF ELEMENTS-FIVE(5)
ELEMENT MATL-DACRON
HOUSING-COPPER/BRONZE
COALESCER UNIT: NO. OF ELEMENTS 60
MATLS: COALESCER ELEMENT FRP TANK SHELL: C.S.

WASTE OIL TANK
CAP: 500 GAL
MATL: CARBON STEEL
SIZE: 3'-6"D X 8'-0"H

EQUIP. TAG NO.	STANDARD/SPEC. NO.	M.E.P.R. No.
16CR-100-T	MP138	443
16CR-102-S	MP157	452
16CR-109-S	MP138	443
16CR-124-N	5082 P 102	
16CR-119-PA	MP154	
16CR-107-N	5082 P 102	
16CR-127-N		
16CR-106-PA/B/C		

REV.	DESCRIPTION
1	APPROVED FOR CONSTRUCTION 7-27-78

FOR PACKAGED P&ID SEE DWG. C-M2001

PSW-1½"-201-872 SERVICE WATER DWG ME3025-1(B-1)

16CR-102-S

CRP 1"-260-068

POLYMER BLD'G FLOOR DRAIN TR. 3"S-8"-202-236

ALTERNATOR

16CR-127-N

CRP 1"-260-001

TO INLET CANAL

ABANDON

COAL PILE RUNOFF

CAT DUMPER E-F DWG M-476 (E-4)

MAIN HOUSE SUMP DWG M-476 (E-4)

BREAKER HOUSE ROOF DRAINS DWG M-476 (E-4)

ABANDON

CRS 6"-104-335

SEE NOTE ④

RAILCAR HOPPER DWG M-476 (E-4) DETAILS

CRS 6"-104-002

FROM WEST SIDE ROOF & YARD BASIN DWG ME3008-2(A-3)

SEE NOTE ②

BREAKER HOUSE DRAINS SOAKAWAY SUMP

SLOPE

GRAVITY FLUME

CRS-10"-201-003

RECYCLE-CRS 10"-201-005

BACKWASH-CRD 4"-201-009

SEE NOTE ③

16CR-107-N

15" CEP PERFORATED PIPE CR-15"-107-267

GRAVEL BED

16CR-119-PA 16CR-119-B

16CR-124-N

SLOPE

4" PRE-FILTER OUTLET HEADER

TO START BACKWASH SEQUENCER

4" PRE-FILTER INLET HEADER

4" BACKWASH HEADER

COALESCING ELEMENT STACK

COALESCING ELEMENT STACK

SET @ 24 PSI

FLUSH CONN.

SEE NOTE ⑤

BACKWASH SEQUENCER

SEE NOTE ⑥

AIR COMPRESSOR WITH DRYER

TO BUILDING FLOOR DRAIN

NO ADDITIONAL PIPING (EC)

CRE 6"-201-005

CRE 6"-201-050

SAMPLE CONN.

SLOPE

CRE 6"-105-006

OUTFALL DRAIN DITCH

CRWG"-201-004

CRWG"-201-048

CRWG"-201-049

CRW 1"-201-268

CRW 1"-201-269

CRW 1"-201

SEE NOTE ①

OUTFALL DRAIN DITCH

SLOPE

TO LAKE

LOCAL

HOSE CONN. CRD 2"-201-068

TO TANK TRUCK

WASTE OIL TK PUMP
CAP: 2.5 GPM @ 25 PSI MAX. DISCH. PRESS.
MATL: HOUSING - CAST IRON
INTERNALS - HARDENED STEEL
MOTOR HP: 1½

NOTES:

① LOCATE OVERFLOW SPILLWAY ON THE SIDE OF THE BASIN NEXT TO THE OUTFALL DRAINAGE DITCH NEAR TO THE END WHERE THE INLET COMES IN.

② THIS IS THE OVERFLOW CHANNEL FROM THE WEST ROOF & YARD BASIN.

③ PERF. DISTRIBUTION TROUGH AND OUTLET DISTRIBUTION PIPE RUN THE FULL WIDTH OF THE BASIN.

④ AIR COMPRESSOR ⑥ MOUNTED ON THE SAME SKID BASE

⑤ BACKWASH SEQUENCER AND SOLENOID VALVES ARE LOCATED IN A CONTROL PANEL MOUNTED ON A STAND AT THE END OF THE SKID BASE

* SUPPLIED WITH THE EQUIPMENT BY VENDOR

16CR-107-N
COAL PILE RUNOFF COLLECTION BASIN
CAP: 2.04 X 10⁶ GAL.
MATL: EARTHEN

16CR-124-N
COAL PILE RUN-OFF COLLECTION SUMP
CAP: 2200 GAL.
SUMP DIMS: 13'-4"L X 15'W X 9'DEEP
EFFECTIVE SUMP DEPTH: 4.5'
MATL: CONCRETE

16CR-119-PA/PB
DISCHARGE & RECYCLE PUMPS
CAP EACH: 500 GPM @ 151.31 FT. TDH
MATL: C.I.
MOTOR HP: 30

APPROVED FOR CONSTRUCTION

COMMONWEALTH EDISON COMPANY
WASTE WATER TREATMENT FACILITIES-WALKER
COAL PILE, ROOF AND YARD RUNOFF PIPING & INSTRUMENTATION DIAGRAM

NUS CORPORATION ROCKVILLE MD

5082ME3008 1

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MICROFILM

Electronic Filing: Received, Clerk's Office 10/31/2022

5082ME3008

EQUIP. TAG NO.	STANDARD/SPEC. NO.	M.E.P.R. NO.
16RY-104-D	MP 137	442
16RY-103-S	MP 151	452
16RY-106-D	MP 137	442
16RY-106-S	MP 137	452
16RY-108-N	5082P102	437
16RY-111-N	5082P102	437
16RY-113-T	MP 141	
16RY-114-T	MP 141	
16RY-130-N	5082P102	437
16RY-123-P	MP 155	
16Y-127-P	MP 155	
16RY-190-PA/PB	MP 154	

NO.	REVISION	BY	DATE
1	APPROVED FOR CONSTRUCTION		7-7-78

16RY-108-N
EAST SIDE RUNOFF BASIN
CAP: 2.0X10⁶ GALLONS
MATL: EARTHEN

16RY-105-S
E. PACKAGED POLYMER FEED SYSTEM
MIX TANK-100 GALLONS
AGING TANK-300 GALLONS
TWO METERING PUMPS-EACH 3 GPM
MIXER MOTOR-¾ HP

16 RY-104-D
E. ROOF & YARD CORRUGATED PLATE OIL SEPARATOR
CAP.: 800 G.P.M.
MAT'L.-SHELL-CARBON STEEL
CORRUGATED PLATES-FRP

OIL RECEIVING TANK
CAP: 275 GALLONS
SIZE: 2'-6"ϕ x 9'-1" H
MAT'L. C.S.

16RY-113-T
E. WASTE OIL TANK
CAP.: 75,000 GALS
MAT'L. C.S.
SIZE: 12'ϕ X 10' HIGH

SERVICE WATER DWG. ME3005-1 (E-3)
PSW-1½"-201-217
PSW-1"-201
CONTAMINATED PLANT AREA ON EAST SIDE
STATION ROOF DRAINS DWG. ME3006-2 (E-4)
RYW-8"-201-213
EFFLUENT FROM FLOOR DRAINS DWG. ME3006-1 (E-4)
TRANSFORMER BALCONY RUN-OFF
CANAL SUMP
E 104
RYW-8"-104-
DISCHARGE AREA RUNOFF
RYW-8"-104-
UNITS 3 & 4 DISCHARGE CANAL DWG. ME3006-1 (E-3)
RYP 1"-103-213
RYP 1"-103-202
FOR PACKAGE P&ID SEE DWG. C-M-2001 16RY-105-S
FE 109
FY 109
FQ 109
ER 109
FM 109 NOTE 1
SLOPE
SLUDGE
SLOPE
RYS-2"-202-227
E 202 201
RYS-2"-201
FLUSH CONN.
DISTRIBUTION TROUGH
PERFORATED PIPE RYW-15"-107-225
GRAVEL BED
RYW-8"-105-224
RYW-8"-224
201 105
COVER
LS 108
LAH 945
OVERFLOW DITCH 24 HR.-10 YR STORM
SLOPE
RYE-8"-201-231
OIL RYO-2"-201-219
WATER RYE-8"-201-232
SAMPLE CONN.
RYE-1"-201
RYW-8"-201-221
PI 112B
PI 112C
HS 304B
HS 304C
NYS-2"-201-214
LAL 941
LS 101
LS 101C
VACUUM LINE/VENT
OIL RECEIVING TANK
PI 112A
PI 1120
HS 304A
LAH 945
HS 325
TIMER
HS 327A
HS 327B
VACUUM PUMPS
CAP. EACH @ 5 CFM @ 5.5" HG
MOTOR H.P.: 1
E. ROOF & YARD WATER REMOVAL PUMPS
CAP. EACH: 500 GPM @ 25.54' TDH
MAT'L.: C.I.
MOTOR HP: 10
E. ROOF & YARD OIL/SLUDGE REMOVAL PUMP
CAP EACH: 20 G.P.M. @ 92' TDH
MAT'L.: HOUSING-C.I.
ROTOR-416 SS. STATOR-BUNAN
MOTOR HP: ½
TO DISCHARGE CANAL
TO DISCHARGE CANAL
RYW-2"-201
FLUSH CONN.
LAH 604
LS 603
LI 111
LS 111
RYI-8"-201 VENT
2'OVERFLOW
4"x2" RED
RYO-2"-201-235
LOCAL
HS 309
TO TANK TRUCK OIL TO BE HAULED OFF-SITE
16RY-123-P
RYO-2"-201-234
RYW-2"-201
FLUSH CONN.
16 RY-113-T

16RY-123-P
OIL LOADING PUMP
CAP.: 50 G.P.M. @ 94 P.S.I. TOTAL DIFFERENTIAL PRESSURE
PUMP BODY-C.I.
ROTOR-C.I.
SHAFT-STEEL
MOTOR HP: 5

ROOF & YARD RUN-OFF – EAST SIDE

DISCONNECT & PLUG
FROM TANK FARM AREA DITCH REF. DWG. AA-9150-D
FROM TANK FARM DRNS REF. DWG. AA-9150-D
FROM FLOOR DRNS REF. DWG. AA-9150-D
AREA DRAINS FROM REF. DWG. AA-9150-D
RAIN GUTTER
RYW-8"-104-
RUNOFF FROM W. SIDE OF MAIN BLDG.
CAR DUMPER AREA
MAIN SWITCH YARD RUN-OFF
WATER COOLED TRANSFORMER DRAINS
E 104
EXISTING CRIB HOUSE DRAINS SEE NOTE 2

16RY-111-N
WEST SIDE RUN-OFF BASIN
CAP.: 1.0X10⁶ GALLONS
MATL: EARTHEN

16RY-106-S
W. PACKAGED POLYMER FEED SYSTEM
MIX TANK-100 GALLONS
AGING TANK-300 GALLONS
TWO METERING PUMPS-EACH 3 GPM
MIXING MOTOR-¾ HP

16RY-105-D
W. CORRUGATED PLATE OIL SEPARATOR
CAP.: 230 GPM
MATL: SHELL-CARBON STEEL
CORRUGATED PLATE-FRP

16RY-114-T
W. WASTE OIL TANK
CAP.: 7500 GALLONS
MATL: C.S.
SIZE: 12'ϕ X 10' HIGH

EXISTING OIL SETTLING BASIN
REMOVE EXISTING PIPING AND CATCH BASIN

RYW-12"-112-238
SLOPE
SLOPE
SLOPE
TO DISCHARGE CANAL
OIL
RYO-2"-201-247
WATER RYW-6"-104-256
RYW-6"-201-257
SAMPLE CONN.
RYW-2"-201
FLUSH CONN.
RYI-8"-201 VENT
2'OVERFLOW
RYO-2"-201-
LOCAL
HS 309
4"x2" RED
16RY-127-P
RYO-2"-201-
RYO-2"-201-
FLUSH CONN.
TO TANK TRUCK OIL TO BE HAULED OFF-SITE
RYO-2"-201-236
16RY-114-T
RYW-2"-201
FLUSH CONN.
RYI-8"-201
VENT
2'OVERFLOW
RYW-6"-104-242
RYW-12"-111-239
SLOPE NOTE 3
NOTE 3
RYW-12"-201-
SLOPE
RYP 1"-103-243
RYP 1"-201
FOR PACKAGE P&ID SEE DWG. C-M-2001D 16RY-106-S
16RY-120-N
PSW-1"-201
SLOPE
RYS-2"-202-250
E 202 201
RYS-2"-201
FLUSH CONN.
NYS-2"-201-215
LAL 942
LS 114
LS 114C
VACUUM LINE/VENT
OIL RECEIVING TANK
LAH 946
PI 114
PI VOD
HS 327A
HS 327B
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EQUIP TAG. NO.	STANDARD / SPEC. NO.	M.E.P.R. NO.
16EA-123-T	MP-145	702
16EA-136-PA	MP-153	449
16EA-136-PB	MP-153	449
16EA-136-PC	MP-153	449
16EA-108-L	MP-142	142

REVISIONS	
NO.	DESCRIPTION
1	APPROVED FOR CONSTRUCTION 7-27-78

UNIT 6 - 8 EXISTING ECONOMIZER F.A. HOPPERS
243 TON/DAY FLY ASH

UNIT 7 - 8 EXISTING ECONOMIZER F.A. HOPPERS
25.1 TON/DAY F.A.

UNIT 8 - 6 EXISTING ECONOMIZER HOPPERS
28.0 TON/DAY F.A.

ATMOSPHERIC VENT TO ROOF

HOPPER DISCHARGE VALVES

6"-EAL

REDUNDANT CONN. TO SILOS

SYSTEM CONTROLS (EXISTING)

5 EACH VACUUM CONNECTIONS ON BLR. ROOM FLOOR

INSIDE | OUTSIDE

BLDG. WALL

ATMOS. VENT EL. 103'-6"

UNIT 6 ASH SLUICE PUMPS

UNIT 6 HYDROVEYOR

UNIT 7 ASH SLUICE PUMPS

UNIT 7 HYDRO-VEYOR

UNIT 8 HYDRO-VEYOR

UNIT 8 ASH SLUICE PUMPS

UNIT 6 AIR SEPARATOR TANK

UNIT 7 AIR SEPARATOR TANK

UNIT 8 AIR SEPARATOR TANK

FROM ASH SLUICE PUMP SUCTION HDR DWG. ME3003-1(C-6)

EXIST. TO UNIT 7 MANHOLE

FROM UNIT 6 ASH SLUICE PUMPS DWG. ME3003-2(D-3)

TO ASH POND ≈ 2000 L.F DWG. ME3003-3 (C-7)

TO BOT. ASH L.P. DRAIN SUMP DWG. ME3003-2 (E-5)

UNIT 7 PLANT SERV WTR SYS DWG. ME3003-2 (A-6)

EXIST SLAG TANK O/F UNIT 7 ASH HOPPER O/F TANK

TO BE REMOVED AFTER INSTALLATION OF 16EA-123-T

TO U-6 CLINKER GRINDER

16EA-123-T
ECONOMIZER F.A. SLUICE TANK
CAP: 3000 GALS, 8'-2" X 8'-0" H.S.R.
MATL: CARBON STEEL

16EA-108-L
CONTINUOUS MIXER
CAP: 56 RPM, ?
MATL: CARBON

16EA-136-PA, B, PC
ECONOMIZER F.A. SLUICE PUMPS
EACH CAP: 300 GPM @ 50 FT TDH

NOTES:

1. PRIMARY SYSTEM PROPOSED: NEW GRAVITY DRAIN LINES FROM UNITS 6 & 7 AIR SEPARATOR TANKS: RELOCATE U8 AIR SEPARATOR TANK @ ≈ ELEV. 52'-0". PROVIDE GRAVITY LINE TO NEW 5' DIA X 6' HIGH SLUICE TK. ON FLOOR #3 HOR. CENT. 1200 GPM PUMPS & ELEC. CONT. MIXER INSIDE TK TO PREVENT F.A. SETTLING. NEW 10" LINE TO ASH POND FOLLOWING SAME ROUTING AS EXISTING ASH SLUICE LINES. LINE LENGTH IS APPROX. 2000 L.F.
2. MIXER TO RUN AS LONG AS THERE IS LIQUID IN TANK. LEVEL SWITCH TO HAVE ZERO SPEED SWITCH WITH A/V ALARM.
3. VALVE OPENED OCCASIONALLY TO FLUSH PIPING.
4. HANDSWITCHES AS, AS, LS & AND ALARMS 311 & 312 DESIGNATED U6 TIE/ ATT/ HESE ITEMS LOCATED AT THE STATION U6 CONTROL BOARD.
5. TWO PUMPS OPERATING WHEN NO SLUICING IS IN PROGRESS, ONE OPERATING PUMP IS REQ'D.
6. FOR PIPE MATERIAL SPECIFICATION SEE DWG 5082ME3120-1
7. EXISTING VALVES SHALL BE REUSED

APPROVED FOR CONSTRUCTION

COMMONWEALTH EDISON CO.
WILL COUNTY WATER TREATMENT FACILITY

ECONOMIZER FLY ASH SYSTEM
PIPING + INSTRUMENTATION DIAGRAM

ENGR CORPORATION ROCKVILLE MD

5082ME3021

38

83-2

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MICROFILM

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5082ME3025

CLARIFIERS AREA

MAIN WASTE WATER TREATMENT BUILDING

COAL PILE RUN-OFF COLLECTION BASIN AREA

WEST YARD RUN-OFF COLLECTION BASIN AREA

ROOF AND EAST YARD COLLECTION BASIN AREA

FLOOR DRAIN SURGE TANK AREA

FLUSH OIL TANK CONN AREA

FLUSH OIL SEPARATOR AREA

OUTSIDE ABOVE GRADE

POLYMER BUILDING

EXISTING 2" SERVICE WATER HEADER 40-60 PSI PRESSURE

FROM INTAKE CANAL

TO DISCHARGE CANAL

NO.3 ASH PIT

OVERFLOW FROM BLOWDOWN CLARIFIER DWG. 5082 ME 3005-G

UNIT 8 TURBINE AREA S.W. HEADER

RECYCLE LINE

CLARIFIER C/F SUMP PUMP

BLOWDOWN CLARIFIER SLUDGE SUMP

BOTTOM ASH SLUICE SYSTEM C/F SUMP

INTERCONNECTING PIPE

METAL CLEANING PUMP HOUSE

METAL CLEANING STORAGE TANK

CAUSTIC FEED TANK AREA

SLUDGE TANK AREA

VACUUM FILTER-A

VACUUM FILTER-B

FILTRATE PUMP-A

FILTRATE PUMP-B

VACUUM PUMP-A

VACUUM PUMP-B

POLYMER MIX/FEED SYSTEM M.C.

POLYMER MIX/FEED SYSTEM B/A

LAB SINK

EYE WASH

SAFETY SHOWER

ACID TANK 16 BA-102 T AREA

MAIN COLL. TANK PUMP HOUSE

POTABLE WATER SUPPLY

EYE WASH

FLUSH CONN.

ABOVE GRADE OUTSIDE

SOUTH SIDE OF PLANT

ABOVE GRADE OUTSIDE NE CORNER OF PLANT

EXISTING 4" POTABLE WATER LINE 80-90 PSI PRESSURE

FROM CITY POTABLE WATER MAIN

2 EMC-05-N CLARIFIER C/F SUMP
FLOW: 10 L x 12 W x 12 D
SIZE: 10 L x 12 W x 12 D
MAT'L.: CONCRETE

IGPS 162-1A, B SERVICE WATER SUPPLY PUMPS
CAP. EACH: 1000 GPM @ 80 PSI
MOTOR: 75HP @ 92% EFF.
MAT'L.: C.I.

NOTES:
1. ALL LINES ARE ABOVE GROUND.
2. ALL OUTSIDE PIPING WILL BE ELECTRICALLY TRACED AND INSULATED EXCEPT OTHERWISE SHOWN

NUMBER	1	2	3		5	6	7	8	9	10	11		13	14	15	16	17	18	19	20	21
REFERENCE DWG. NO.	5082 ME 3003-H (C-7)		5082 ME 3003-A(B-1)		5082 ME 3003-3(B-5)	5082 ME 3003-5(E-1)	5082 ME 3005-5(D-4)	5082 ME 3005-4(B-3)	5082 ME 3005-4(C-4)	5082 ME 3005-4(E-6)	5082 ME 3005-4(B-2)		5082 ME 3005-5(D-5)	5082 ME 3005-5(E-6)	5082 ME 3005-2(E-7)	5082 ME 3005-5(D-5)	5082 ME 3006-3(D-6)	5082 ME 3003-2(D-5)	5082 ME 3006-2(E-7)	5082 ME 3003-2(C-7)	5082 ME 3008-2(B-6)
EQUIPMENT OR FLUSH CONN. NO	6BA-102-21/B7		6BA-108-PA/B		6BA-104-PA/B	6BA-100-S	MCS-1207	MCC-1210	MCS-1½-202	IGMC-101-S	IGMC-111-PA/B		IGMC-101-FA VAC. PUMP	IGMC-101-FA	IGMC-101-FB VAC. PUMP	IGMC-101-FB	FDW-2"-202	RYS-2"-201	IGRV-105-S	IGRV-106-S	RYS-2"-201
WATER QUANTITY REQUIRED GPM	450		15		30	20	15	15	15	10	15		26	50	26	50	50	50	20	20	50
DESIGN LIFE FREQUENCY	15 MIN. ONCE/DAY		24 HRS/DAY		24 HRS/DAY	24 HRS/DAY	1 HR FLUSH AT RANDOM INTERVALS	1 HR. FLUSH AT RANDOM INTERVALS	1 HR. FLUSH AT RANDOM INTERVALS	30-48 HRS. AT PERIODICAL INTERVALS	30-48 HRS AT PERIODICAL INTERVALS		30-48 HRS AT PERIODICAL INTERVALS	30-48 HRS. AT PERIODICAL INTERVALS	30-48 HRS. AT PERIODICAL INTERVALS	30-48 HRS. AT PERIODICAL INTERVALS	1 HR. FLUSH AT RANDOM INTERVALS	1 HR. FLUSH AT RANDOM INTERVALS	24 HRS/DAY	24 HRS/DAY	1 HR. FLUSH AT RANDOM INTERVALS

NUMBER	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42
REFERENCE DWG. NO.	5082 ME 3008-1(E-1)	5082 ME 3003-K	5082 ME 3008-1(D-2)	5082 ME 3005-5(C-4)	5082 ME 3005-4(C-4)		—	—	—		5082 ME 3008-2(G-3)	5082 ME 3008-2(D-1)	5082 ME 3008-2(E-3)	5082 ME 3005-2(D-2)	5082 ME 3005-2(D-2)	5082 ME 3005-5(D-5)	5082 ME 3006-3(D-6)	5082 ME 3005-2(B-5)	5082 ME 3005-2(C-3)		
EQUIPMENT OR FLUSH CONN. NO.	16GRV-02-S	6BA-102-H	FLUSH CONN #2	MCS-1" 202	MCS-1" 210		SAFETY SHOWER	EYE WASH BASIN	LAB SINK	SAFETY SHOWER	RYW-2"-201	RYW-2"-201	RYW-2"-201	RYW-2"-201	RYW-2"-201	FDW-2"-202 -079	FDW-2"-202 -091	MCS-1½"-202	MCS-1½"-202		
WATER QUANTITY REQUIRED GPM	20	450	40	15	15		12 GPM POTABLE WATER	2 GPM POTABLE WATER	12 GPM POTABLE WATER	12 GPM POTABLE WATER	50	50	50	50	50	50	50	40	40		
DESIGN LIFE FREQUENCY	24 HRS/DAY	2 MIN. AT RANDOM INTERVALS	1 HR. FLUSH AT RANDOM INTERVALS	1 HR. FLUSH AT RANDOM INTERVALS	1 HR. FLUSH AT RANDOM INTERVALS		15 TO 30 MIN AT RANDOM INTERVALS	10-15 MIN AT RANDOM INTERVALS	RANDOM INTERVALS	5-6 MIN AT RANDOM INTERVALS	1 HR. FLUSH AT RANDOM INTERVALS	1 HR. FLUSH AT RANDOM INTERVALS	1 HR. FLUSH AT RANDOM INTERVALS	1 HR. FLUSH AT RANDOM INTERVALS	1 HR. FLUSH AT RANDOM INTERVALS	1 HR. FLUSH AT RANDOM INTERVALS	1 HR. FLUSH AT RANDOM INTERVALS	1 HR. FLUSH AT RANDOM INTERVALS	1 HR. FLUSH AT RANDOM INTERVALS		

REVISIONS	
NO.	DESCRIPTION
1	APPROVED FOR CONSTRUCTION 7-17-79

APPROVED FOR CONSTRUCTION

COMMONWEALTH EDISON COMPANY
ZION NUCLEAR POWER STATION
WASTE WATER TREATMENT FACILITIES-WAUKEGAN

UTILITIES DISTRIBUTION DIAGRAM
SERVICE WATER

SARGENT & LUNDY CONTRACT 5082GTO | DRAWING NO. 5082ME3025 | REV. 1

NUS CORPORATION

SCALE NONE | SHEET 1 OF 2

23-210-16

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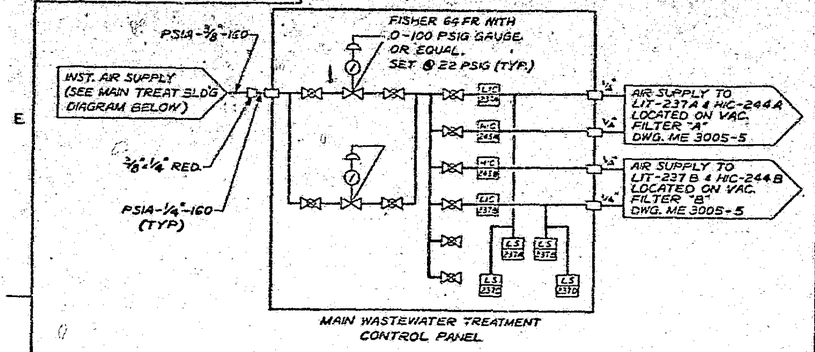
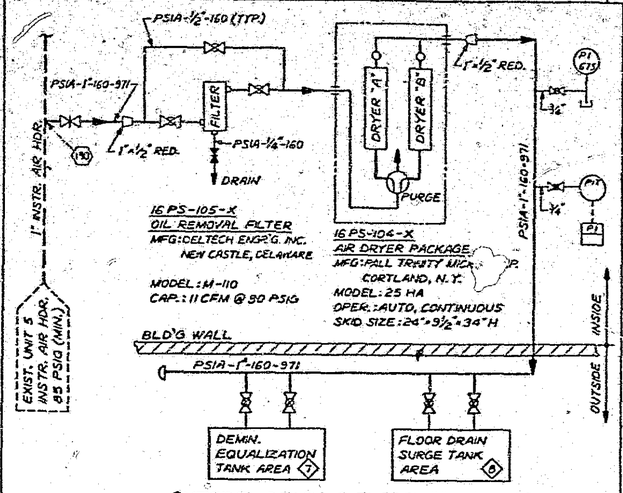
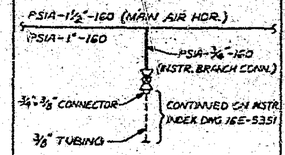


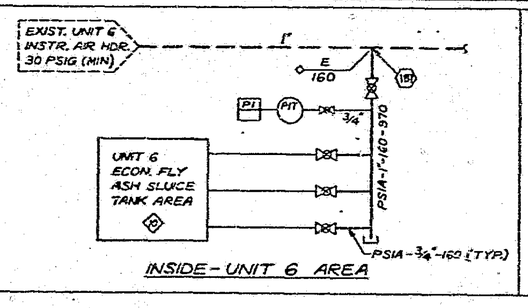
MAIN WASTE TREAT. PANEL DETAIL



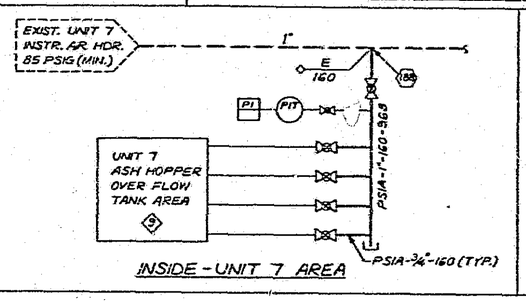
OUTSIDE - DEMIN & FLOOR DR. AREAS



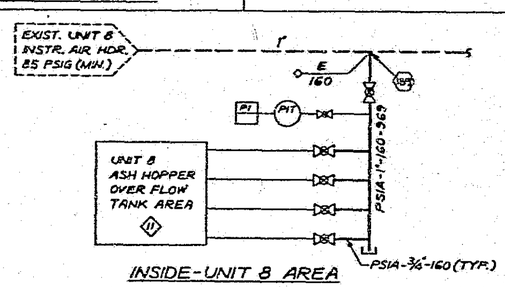
TYPICAL INSTR. BRANCH CONN DETAIL



INSIDE - UNIT 6 AREA



INSIDE - UNIT 7 AREA

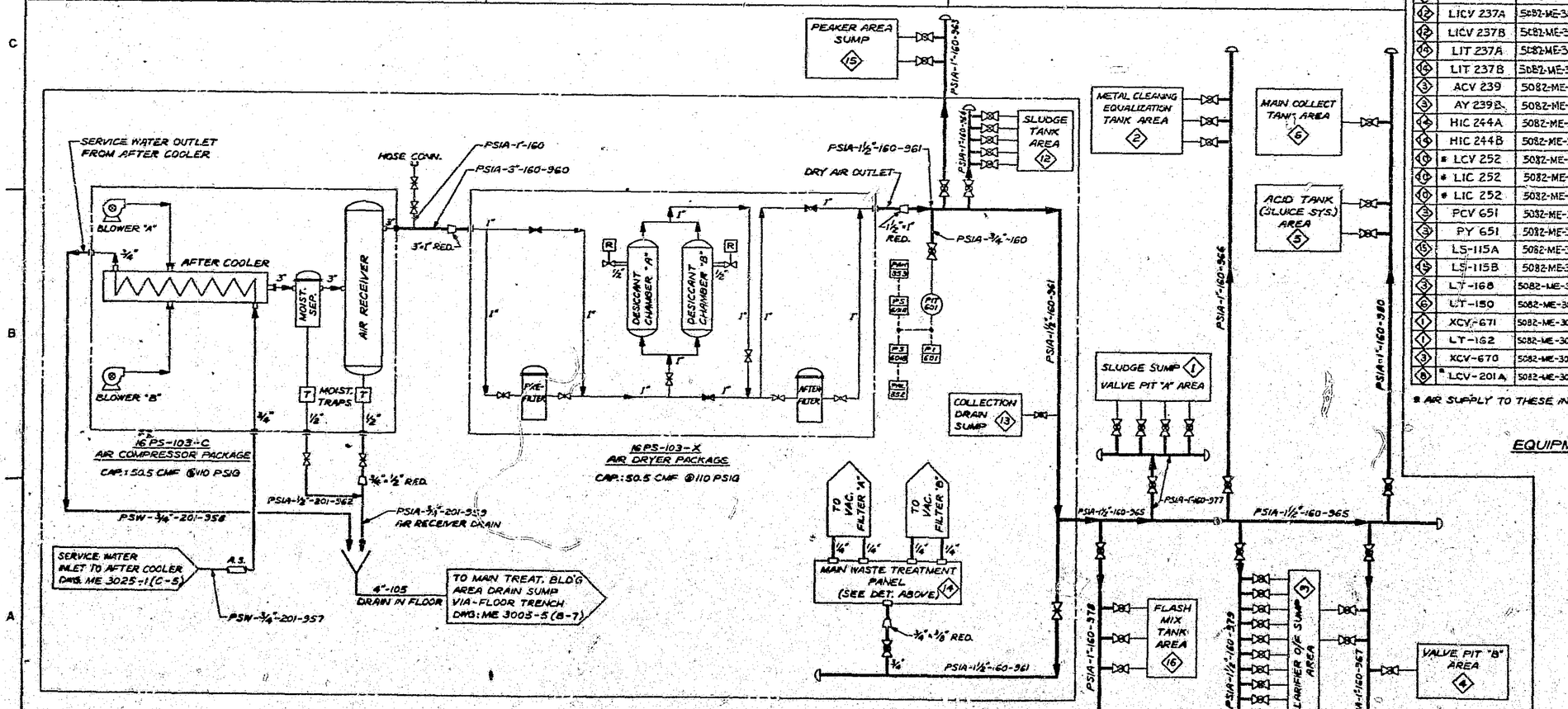


INSIDE - UNIT 8 AREA

AREA NO	INSTRUMENT NO	REFERENCE DWG.	AREA LOCATION	AIR SERVICE
7	* XCV 128A	5082-ME-3004-1 (E3)	DEMIN. EQUAL. TANK	INSTRUMENT AIR
7	* XCV 128B	5082-ME-3004-1 (C3)	"	"
5	ACV 154	5082-ME-3003-3 (E3)	ACID TANK (SLUICE SYS.) AREA	"
5	AY 154B	5082-ME-3003-3 (E2)	"	"
3	FCV 158	5082-ME-3003-4 (C5)	CLARIFIER O/F SUMP AREA	"
3	FY 158	5082-ME-3003-4 (C6)	"	"
1	XCV 159	5082-ME-3003-4 (C6)	CLARIFIER VALVE PIT "A"	"
2	XCV 160	5082-ME-3003-4 (C4)	CLARIFIER VALVE PIT "B"	"
3	XCV 163A	5082-ME-3003-3 (C3)	CLARIFIER O/F SUMP AREA	"
3	XCV 163B	5082-ME-3003-3 (C2)	"	"
3	ACV 166	5082-ME-3003-3 (B-1)	"	"
3	AY 166B	5082-ME-3003-3 (B-1)	"	"
9	* LCV 180A	5082-ME-3003-2 (B5)	UNIT 7 ASH HOPPER O/F TANK	"
9	* LCV 180B	5082-ME-3003-2 (B5)	"	"
9	* LICS 180	5082-ME-3003-2 (C6)	"	"
9	* LICS 180	5082-ME-3003-2 (C6)	"	PURGE AIR
11	* LCV 183A	5082-ME-3003-2 (B3)	UNIT 8 ASH HOPPER O/F TANK	INSTRUMENT AIR
11	* LCV 183B	5082-ME-3003-2 (B3)	"	"
11	* LICS 183	5082-ME-3003-2 (C2)	"	"
11	* LICS 183	5082-ME-3003-2 (C2)	"	PURGE AIR
8	* LY 201A	5082-ME-3006-3 (D6)	FLOOR DRAIN SURGE TANK AREA	INSTRUMENT AIR
2	LICV 220	5082-ME-3005-4 (C5)	METAL CLEANING WASTE WATER EQUAL. TANK	"
2	LY 220A	5082-ME-3005-4 (C5)	"	"
2	LY 220B	5082-ME-3005-4 (C5)	"	"
16	ACV 224A	5082-ME-3005-4 (D3)	CLARIFIER FLASH MIX TANK AREA	"
16	ACV 224B	5082-ME-3005-4 (D3)	"	"
15	AY 224B	5082-ME-3005-4 (C5)	"	"
13	LS 227	5082-ME-3005-5 (B7)	MN. TREAT. BLD'G COLL. DR. SUMP	PURGE AIR
1	LS 231A&B	5082-ME-3005-5 (B4)	CLARIFIER SLUDGE SUMP	"
12	LT 236	5082-ME-3005-5 (E4)	MN. TREAT. BLD'G SLUDGE TANK	"
12	LICV 237A	5082-ME-3005-5 (D4)	MN. TREAT. BLD'G DISCH. OF SLUDGE TK.	INSTRUMENT AIR 2-AIR CONN. REQ.
12	LICV 237B	5082-ME-3005-5 (D3)	"	"
14	LIT 237A	5082-ME-3005-5 (D5)	MN. TREAT. BLD'G CONTROL PANEL TO VAC. FILTER "A"	PURGE AIR
14	LIT 237B	5082-ME-3005-5 (D3)	MN. TREAT. BLDG CONTROL PANEL TO VAC. FILTER "B"	"
3	ACV 239	5082-ME-3005-5 (C5)	CLARIFIER O/F SUMP AREA	INSTRUMENT AIR
3	AY 239B	5082-ME-3005-5 (C5)	"	"
14	HIC 244A	5082-ME-3005-5 (D4)	MN. TREAT. BLD'G CONTROL PANEL TO VAC. FILTER "A"	"
14	HIC 244B	5082-ME-3005-5 (D3)	MN. TREAT. BLDG CONTROL PANEL TO VAC. FILTER "B"	"
6	* LCV 252	5082-ME-3021-1 (B5)	UNIT 6 ECON. FLY ASH SLUICE TK.	"
6	* LIC 252	5082-ME-3021-1 (B4)	"	"
6	* LIC 252	5082-ME-3021-1 (B4)	"	PURGE AIR
3	PCV 651	5082-ME-3025-1 (C6)	CLARIFIER O/F SUMP AREA	INSTRUMENT AIR
3	PY 651	5082-ME-3025-1 (C6)	"	"
15	LS-115A	5082-ME-3008-2 (B-6)	PEAKER AREA	PURGE AIR
15	LS-115B	5082-ME-3008-2 (B-6)	"	"
3	LT-168	5082-ME-3003-4 (B-3)	CLARIFIER O/F SUMP AREA	"
6	LT-150	5082-ME-3003-3 (E-6)	MAIN COLLECTION TANK AREA	"
1	XCV-671	5082-ME-3003-4 (B-7)	SLUDGE SUMP AREA	INSTRUMENT AIR
1	LT-162	5082-ME-3003-4 (B-5)	"	PURGE AIR
3	XCV-670	5082-ME-3025-1 (D-7)	CLARIFIER O/F SUMP AREA	INSTRUMENT AIR
6	* LCV-201A	5082-ME-3006-3 (D-6)	FLOOR DRAIN SURGE TANK AREA	"

* AIR SUPPLY TO THESE INSTRUMENTS WILL BE FROM AN EXIST. SYSTEM.

EQUIPMENT LIST (DWG. ME 3025-1)



MAIN WASTE TREATMENT BUILDING

REVISIONS

REV.	DESCRIPTION
1	APPROVED FOR CONSTRUCTION 7-27-78 JL
2	ADDED LT-168, LT-150, XCV-671, LT-162, XCV-670 & LCV-201A. DETAIL MINOR REVISIONS. REVISED TITLE BLOCK.

DRAFTED
CHECKED
COG ENG.
ELECTR.
CONSTRUCT.
NSCA MGR.
P.E. NO 36420
PROJECT

07580000100
MICROFILM

APPROVED FOR CONSTRUCTION
COMMONWEALTH EDISON COMPANY
WASTEWATER TREATMENT FACILITIES
UTILITIES DISTRIBUTION DIAGRAM
INSTR./ SERVICE AIR
CECO CONTRACT 802670
NUS CORPORATION ROCKVILLE, MD
CECO DWG NO
DRAWING NO. 5082ME3025
REV 2
SCALE: NONE
SHEET 2 OF 2

83-22

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STATE OF ILLINOIS

ENVIRONMENTAL PROTECTION AGENCY

The preceding 25 image(s) are partially illegible in the copy sent to be microfilmed. The resulting microfilm may be illegible for use.

Signed: Leon C. Baker

ADM-1041A REV. (4/77)

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5082ME3009

REVISIONS		
LTR	DESCRIPTION	IDENTIFICATION
A	ISSUED FOR INITIAL REVIEW. O.R. 10-7-76	
B	MISC. REVISIONS. ISSUED FOR PROJECT REVIEW O.R. 10-7-76	
C	ISSUED FOR CLIENT CONCEPT REVIEW. 10-7-76 COG. ENG. SYS. ENG. P.E.	
D	MISC. REVISIONS. 1-5-77 COG. ENG. SYSTEM P.E.	
E	ISSUED FOR PROJECT REVIEW 3-30-77	
F	RELEASED FOR ENGINEERING 4-14-77 SYS. ENGR. LEAD ENGR. PROJ. ENGR. PROC. MGR.	
G	GENERAL REVISIONS SYS. ENGR. LEAD ENGR. PROJ. ENGR. PROC. MGR. 5-14-77	
H	GENERAL REVISIONS SYS ENGR LEAD ENGR PROJ. ENGR MECH. MGR. 5-4-78	

FROM UNITS 6, 7, 8 ECONOMIZER SLUICE, DWG ME 3022

MAKE-UP (13)

UNITS 7 & 8 HEAD TANK

O/F (2)

BOILER 17 (UNIT 6) SLAG TANKS (7)

O/F (10)

DEWATERING BINS

O/F (12)

SOLIDS HAULED AWAY (14)

U/F (13)

TO ECONOMIZER SLUICE COLLECTION TANK DWG ME 3022 (4)

HOUSE SERVICE WATER (8)

UNIT 6 TURBINE OIL COOLERS (9)

TO ECONOMIZER SLUICE COLLECTION TK DWG ME 3022 (11)

MAIN COLLECTION TANK

(33)

ASH PONDS

(40)

(1)

(32)

(39)

ACID FEED SYSTEM

FILTER BACKWASH (32)

FROM H.G. WATER COLLECTION SYSTEM (41)

(34)

(16)

UNIT 7A REHEAT FURNACE ASH HOPPER

O/F (7)

UNIT 7 OVERFLOW TANK

(43)

(24)

UNIT 7 PYRITES (18)

H.P. SERVICE WATER (19)

L.P. SERVICE WATER (20)

UNIT 7B SUPERHEAT FURNACE ASH HOPPER

O/F (22)

(23)

DRY POLYMER (44)

POLYMER FEED SYSTEM

(37)

(45)

ERASE WATER

BLOWDOWN CLARIFIER

CLARIFIER SUMP

(35)

TO DISCHARGE CANAL

(36)

SLUDGE SUMP

(47)

UNIT 7 ECONOMIZER REAR PASS HYDROVACTOR (17)

TO ECONOMIZER SLUICE COLLECTION TK DWG ME 3022

FROM METAL CLEANING WASTE SYSTEM DWG. ME 3011

UNIT 8 REHEAT FURNACE ASH HOPPER

O/F (25)

(29)

UNIT 8 PYRITE (27)

L.P. SERVICE WATER (28)

(26)

(30)

UNIT 8 SUPERHEAT FURNACE ASH HOPPER

O/F

UNIT 8 OVERFLOW TANK

(42)

(31)

UNIT 8 ECONOMIZER REAR PASS HYDROVACTOR

TO ECONOMIZER SLUICE COLLECTION TANK DWG ME 3022

RELEASED FOR ENGINEERING

COMMONWEALTH EDISON COMPANY
WASTE WATER TREATMENT FACILITIES-WAUKEGAN

BOTTOM ASH SLUICE SYSTEM
PROCESS FLOW DIAGRAM

NUS CORPORATION ROCKVILLE, MD.

5082ME3009 REV. H

183-26 20

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5082ME3009 H

	UNITS	LINE NUMBER 1	2	4	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47
	GPM	4750	1950	1100	1700	760	80	2300	240	2300	0	0	—	0	0	400	0	440	420	420	0	940	0	0	430	300	0	730	730	650															
	GPM	4750	2600	1100	0	400	80	0	480	0	0	0	—	1050	0	400	875	440	0	420	2345	420	0	0	430	300	0	730	730	650															
	GPM	4750	2015	1100	0	400	80	0	480	0	0	0	—	0	0	400	0	440	420	420	0	940	1575	0	430	300	1940	365	365	650															
																														NOT APPLICABLE SEE MODES 1 & 2 BELOW														
FLOW- MODE D	GPM	4750	900	1100	1700	760	80	2300	240	2300	0	0	—	1050	0	400	875	440	0	420	2345	420	0	0	430	300	0	730	730	650															
FLOW- MODE E	GPM	4750	375	1100	1700	760	80	2300	240	2300	0	0	—	0	0	400	0	440	420	420	0	940	1575	0	430	300	1940	365	365	650															
FLOW- MODE F	GPM	4750	3550	1100	0	400	80	0	480	0	0	0	—	0	0	400	0	440	420	420	0	940	0	0	430	300	0	730	730	650															
MODE 1																																												
FLOW NORMAL	GPM	4750	—	1100	1700	760	80	2300	480	2300	0	0	0	1050	0	400	875	440	420	420	2345	940	1575	0	430	300	1940	730	730	650	12,500	2800	2150	4750	0	2.75	0.49	0.23	1200	500	270	160		2.75	1200	1600
MAXIMUM	GPM	7500	3550	1100	1700	760	80	2300	480	2300	5500[A]	0	0	1050	1030	400	875	449	420	420	2345	940	1575	1080	430	300	1940	730	730	650	12,500	2800	2150	4750	450	2.75	0.49	0.23	2800	500	1000	1000		2.0	1200	1600
MINIMUM	GPM	4750	375	1100	0	400	80	0	240	0	0	0	0	0	0	400	0	440	0	0	0	420	0	0	430	300	0	365	365	0	0	0	0	0	0	0	0	0	0	270	160		2.75	0	0
TOTAL DAILY FLOW	MGD	6.84	2.19	1.58	1.22	0.84	0.12	1.66	0.52	1.66	17.29 GPD	194.3 GPD	0	0.57	0.12	0.58	0.47	0.63	0.49	0.49	1.27	0.92	0.55	0.29	0.62	0.43	1.05	0.85	0.85	0.17	5.95	3.96	5.72	15,600 GPD	3.51 GPD	0.05 GPD	4.15 GPD	2.53	0.10			33,555 GPD	4,666 GPD	0.02	1.76
DAILY DURATION	HRS	24	24	24	12	24	24	12	24	12	—	—	—	9	4	24	9	24	19.5	19.5	9	24	9	14.5	24	24	9	24	24	7.5	8.3	24	24.1	0.51	24	—	24	24	3.4					24	0.3	18.3
FREQUENCY	CONT/DAY	CONT	CONT	CONT	1	CONT	CONT	1	CONT	1	INTER	INTER	INTER	3	1	CONT	3	CONT	3	3	3	CONT	3	1	CONT	CONT	3	CONT	CONT	INTER	INTER	INTER	INTER	INTER	INTER	INTER	INTER	CONT	INTER					CONT	INTER	INTER
TEMPERATURE	°F	AMB	AMB	AMB	AMB	AMB	100[A]	AMB	150[A]	AMB	AMB	—	AMB	AMB	AMB	AMB	AMB	AMB	150[A]	150[A]	AMB	150[A]	AMB	AMB	AMB	AMB	AMB	AMB	150[A]	150[A]	AMB	AMB	AMB	AMB	AMB	AMB	AMB	AMB	150					AMB	AMB	AMB
PRESSURE	PSIG	15	0	150	300	50[A]	15	35[A]	0	0	0	—	50[A]	300	300	90	90	30	0	0	45[A]	10[A]	300	300	90	30	45[A]	0	10[A]	10[A]	24.7	15/28	33	7	25	30	12	—	K100					50	10	15-10
pH	6.9	—	—	—	6.0	7.5	7.5	8.0	—	—	—	—	7.5	6.0	—	7.2	7.5	7.5	—	—	10-12	—	6.0	—	7.2	7.5	10-12	—	—	7.5	—	8-11	6.0-9.0	—	—	—	—	12	10.5	SEE				6.0	6-9
TSS	mg/l	—	—	—	<200	5.0	5.0	11000	—	—	—	—	5.0	<200	—	63	5	5	—	—	14,000	—	<200	—	—	63	5	15,500	—	—	<200	15	—	—	—	—	—	31,000	—	NOTE				—	15
OIL & GREASE	mg/l	—	—	—	—	2.0	2.0	—	—	—	—	—	2.0	—	—	—	2	2	—	—	—	—	—	—	—	—	2	—	—	—	2	—	15	—	—	—	—	—	—	—	7				—	15
IRON TOTAL(DISSOLVED)	mg/l	—	—	—	0.28	0.07	0.07	0.39	—	—	—	—	0.07	0.28	—	—	0.07	0.07	—	—	0.20	—	0.28	—	—	0.07	—	0.28	1.0	—	—	—	—	—	—	—	—	—	0.19	—					—	—	20.0
COPPER	mg/l	—	—	—	0.49	0.02	0.02	0.39	—	—	—	—	0.02	0.49	—	—	0.02	0.02	—	—	0.33	—	0.49	—	—	0.02	0.50	—	—	—	0.02	—	0.49	1.0	—	—	—	—	—	0.54	—					—	—	1.0
ZINC	mg/l	—	—	—	0.25	0.04	0.04	0.20	—	—	—	—	0.04	0.25	—	—	0.04	0.04	—	—	0.26	—	0.25	—	—	0.04	0.34	—	—	—	0.04	—	0.23	1.0	—	—	—	—	—	0.66	—					—	—	1.0
CHROMIUM (TOTAL)	mg/l	—	—	—	0.14	0.03	0.03	0.12	—	—	—	—	0.03	0.14	—	—	0.03	0.03	—	—	0.08	—	0.14	—	—	0.03	0.12	—	—	—	0.03	—	0.14	1.0	—	—	—	—	—	0.37	—					—	—	1.0
PHOSPHOROUS	mg/l	—	—	—	0.50	0.02	0.02	0.58	—	—	—	—	0.02	0.50	—	—	0.02	0.02	—	—	0.51	—	0.50	—	—	0.02	0.69	—	—	—	0.02	—	0.50	1.0	—	—	—	—	—	0.14	10-100					—	—	1.0
TDS	mg/l	—	—	—	1272	176	176	1228	—	—	—	—	176	1272	—	—	176	176	—	—	564	—	1272	—	—	176	1203	—	—	—	176	—	1062	1500	—	—	—	—	—	1535	620					—	—	—
MODE 2																																												
FLOW - NORMAL	GPM	4750	—	1100	1700	400	80	2300	480	2300	0	0	0	1050	0	400	875	440	420	420	2345	940	1575	0	430	300	1940	730	730	650	12,500	2800	2150	4750	0	12.81	0.49	0.23	1200	500	270	160		2.8	1200	1600
MAXIMUM	GPM	7500	3550	1100	1700	760	80	2300	480	2300	5500[A]	0	0	1050	1030	400	875	440	420	420	2345	940	1575	1080	430	300	1940	730	730	650	13,300	2800	2150	4750	450	2.81	0.49	0.23	2800	500	1000	1000		2.0	1200	1600
MINIMUM	GPM	4750	375	1100	0	400	80	0	240	2300	0	0	0	0	0	400	0	440	0	0	0	420	0	0	430	300	0	365	365	0	0	0	0	0	0	0	0	0	0	270	160		2.8	0	0
TOTAL DAILY FLOW	MGD	6.84	1.53	1.58	1.53	0.92	0.12	2.21	0.46	2.21	17.29 GPD	194.3 GPD	0	0.57	0.12	0.58	0.47	0.63	0.49	0.49	1.27	0.95	0.55	0.29	0.62	0.43	1.05	0.85	0.85	0.17	6.05	4.04	5.80	15,600 GPD	3.51 GPD	0.05 GPD	4.15 GPD	2.53	0.10			33,555 GPD	4,666 GPD	0.02	1.76
DAILY DURATION	HRS	24	—	24	16	24	24	16	24	16	—	—	—	9	4	24	9	24	19.5	19.5	9	24	9	4.5	24	24	9	24	24	7.5	8.45	24	24.1	0.58	24	—	24	24	3.4					24	0.3	18.3
FREQUENCY	CONT/DAY	CONT	CONT	CONT	1	CONT	CONT	1	CONT	1	INTER	INTER	INTER	3	1	CONT	3	CONT	3	3	3	CONT	3	1	CONT	CONT	3	CONT	CONT	INTER	INTER	INTER	INTER	INTER	INTER	INTER	INTER	CONT	INTER					CONT	INTER	INTER
TEMPERATURE	°F	AMB	—	AMB	AMB	AMB	100[A]	AMB	150[A]	AMB	AMB	—	AMB	AMB	AMB	AMB	AMB	AMB	150[A]	150[A]	AMB	150[A]	AMB	AMB	AMB	AMB	AMB	AMB	150	150	AMB	AMB	AMB	AMB	AMB	AMB	AMB	AMB	150					AMB	AMB	AMB
PRESSURE	PSIG	15	—	150	300	90	90	30	0	0	0	—	50[A]	300	300	90	90	30	0	0	45	10[A]	300	300	90	30	45[A]	0	10[A]	10[A]	24.7	15/28	33	7	25	30	12	—	K100					50	10	15-10
pH	6.0	—	—	—	6.0	7.5	7.5	8.0	—	—	—	—	7.5	6.0	—	7.2	15	7.5	—	—	10-12	—	6.0	—	—	7.5	10-12	—	—	—	—	8-11	6.0-9.0	—	—	—	—	12	10.5	SEE				6.0	6-9
TSS	mg/l	—	—	—	<200	5.0	5.0	11000	—	—	—	—	5.0	<200	—	63	5	5	—	—	14,000	—	<200	—	—	5	15,500	—	—	—	200	15	—	—	—	—	—	31,000	—	NOTE				—	15
OIL & GREASE	mg/l	—	—	—	—	2.0	2.0	—	—	—	—	—	2.0	—	—	—	2	2	—	—	—	—	—	—	—	—	2	—	—	—	—	15	—	—	—	—	—	—	—	7				—	15	
IRON TOTAL(DISSOLVED)	mg/l	—	—	—	0.39	0.07	0.07	0.47	—	—	—	—	0.07	0.39	—	—	0.07	0.07	—	—	0.25	—	0.39	—	—	0.07	0.33	—	—	—	—	—	0.39	1.0	—	—	—	—	—	0.52	—					—	—	20.0
COPPER	mg/l	—	—	—	0.47	0.02	0.02	0.38	—	—	—	—	0.02	0.47	—	—	0.02	0.02	—	—	0.32	—	0.47	—	—	0.02	0.49	—	—	—	—	—	0.47	1.0	—	—	—	—	—	0.63	—					—	—	1.0
ZINC	mg/l	—	—	—	0.24	0.04	0.04	0.14	—	—	—	—	0.04	0.24	—	—	0.04	0.04	—	—	0.26	—	0.24	—	—	0.01	0.33	—	—	—	—	—	0.24	1.0	—	—	—	—	—	0.35	—					—	—	1.0
CHROMIUM (TOTAL)	mg/l	—	—	—	0.16	0.03	0.03	0.14	—	—	—	—	0.03	0.16	—	—	0.03	0.03	—	—	0.08	—	0.16	—	—	0.03	0.14	—	—	—	—	—	0.16	1.0	—	—	—	—	—	0.37	—					—	—	1.0
PHOSPHOROUS	mg/l	—	—	—	0.61	0.02	0.02	0.63	—	—	—	—	0.02	0.61	—	—	0.02	0.02	—	—	0.36	—	0.51	—	—	0.02	0.71	—	—	—	—	—	0.61	1.0	—	—	—	—	—	0.97	10-100					—	—	1.0
TDS	mg/l	—	—	—	1395	176	176	1379	—	—	—	—	176	1395	—	—	176	176	—	—	784	—	1395	—	—	176	1333	—	—	—	—	—	1235	1500	—	—	—	—	—	1570	620					—	—	—

(A) ESTIMATED VALUE

OPERATING MODES A THRU L INDICATE THAT THE FOLLOWING BOTTOM ASH SLUICING OPERATIONS ARE TAKING PLACE:

MODE A = 6
MODE B = 7
MODE C = 8
MODE D = 6,7
MODE E = 6,8
MODE F = NONE

NOTES:

① ALL FLOWS HAVE BEEN CALCULATED ASSUMING OVERFLOW TANK PUMPS ARE IN OPERATION.

② FLOWS SHOWN IN MODES A THROUGH L INCLUDE THE FLOW REQUIRED FOR UNIT 6 ECONOMIZER SLUICING. FOR OTHER ECONOMIZER SLUICE FLOWS SEE DWG. 5082-ME-3022. MAXIMUM FLOWS AND TOTAL DAILY FLOWS IN MODES 1 AND 2 INCLUDE ALL ECONOMIZER SLUICE FLOWS.

③ FLOWS ASSUME UNIT 7 BOILER A IS BEING SLUICED.

④ MODES 1 AND 2 INDICATE THE FOLLOWING 24 HOUR OPERATING SCHEMES:
MODE 1: UNIT 6 — 12 HOURS OF SLUICING
UNITS 7 & 8 - 9 HOURS OF SLUICING
MODE 2:
UNIT 6 - 16 HOURS OF SLUICING
UNITS 7 & 8 - 9 HOURS OF SLUICING

⑤ DUE TO SEQUENCING OF FILTER BACKWASH OPERATION TOTAL DAILY FLOW IN LINE 32 CANNOT BE CALCULATED DIRECTLY FROM GIVEN FLOW RATES.

⑥ UNIT 8 LOW LEVEL ECONOMIZER HOPPERS ARE OUT OF SERVICE.

⑦ LINES 42 AND 43 SERVE ONLY AS RECYCLE LINES TO INSURE AGITATION IN UNITS 7 AND 8 ASH HOPPER OVERFLOW TANKS.

PARTS LIST

REF INTER	DESCRIPTION	REQ'D	IDENTIFICATION MATERIAL	PART NO. OR SPECIFICATION

REVISIONS

REV	DESCRIPTION
A	ISSUED FOR INITIAL REVIEW C.R. Starkey 10-7-76
B	MISC. REVISIONS ISSUED FOR PROJECT REVIEW C.R. Starkey 10-7-76
C	ISSUED FOR CLIENT CONCEPT REVIEW. 10-7-76 COG. ENG. SYS. ENG. P.E.
D	MISC REVISIONS 2/14/77 COG. ENG. SYS. ENG. P.E.
E	ISSUED FOR PROJECT REVIEW 3-30-77 G. Zigman
F	RELEASED FOR ENGINEERING 4-14-77 SYS. ENGR. LEAD ENGR. PROJ. ENGR. PROC. MGR.
G	GENERAL REVS. SYS. ENGR. LEAD ENGR. PROJ. ENGR. PROC. MGR. 10-14-77
H	GENERAL REVS. SYS ENGR. LEAD ENGR. PROJ. ENGR. MECH. MGR. 4-4-78

RELEASED FOR ENGINEERING

COMMONWEALTH EDISON COMPANY
WASTE WATER TREATMENT FACILITIES ENGINEERING
BOTTOM ASH SLUICE SYSTEM
PROCESS FLOW DIAGRAM

NUS CORPORATION ROCKVILLE, MD

DRAWING NO. 5082ME3009 REV. H

188-2721

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5082ME3010 2

DEMINERALIZER SUMP PUMP

STORAGE TANKS

LEAKAGE FROM UNIT 2 DEMINERALIZER TRAIN

DEMINERALIZER SUMP

INSIDE — OUTSIDE

EQUALIZATION TANK

FROM REGEN. WASTE SUMPS

FROM DEMIN. WASTE OVERFLOW SUMP

TO DISCHARGE CANAL

DEMIN. REGEN. WASTE DRAIN PUMP

DEMIN. REGEN. WASTE DRAIN TANK

DISCHARGE PUMP

EQUALIZATION DISCHARGE PUMP

NOTES:

1. THIS VOLUME IS PUMPED TO DISCHARGE CANAL EVERY TWO DAYS.

ANALYSIS	UNITS	STREAM NO. ①	②	③	④	⑤	⑥	⑦	⑧
NORM. FLOW RATE MIN/MAX	GPM	400	250/1000	250	0/50	1000	0/50	400/500	400/500
DESIGN FLOW RATE	GPM	400	1000	250	50	1000	50	500	500
DAILY FLOW	GPD	22,860	22,860	3,000	AS REQUIRED	150,000	AS REQUIRED	22,860	22,860
FREQUENCY OF FLOW		INTER.	CONT.	CONT.	INTER.	EMER.	INTER.	INTER.	INTER.
TEMPERATURE	°F	80	HEAT TRACED	HEAT TRACED	80	HEAT TRACED	80	80	HEAT TRACED
pH		1-12	1-12	1-12	1-12	1.1	1-12	1-12	1-12
NOMINAL FRESHEET	PSIA	43.8	45.3/65	+57	43.8	158	43.8	43.8	43.8
COPPER (AS Cu)	Mg/L	≤1.0	≤1.0	≤1.0	≤1.0	≤1.0	≤1.0	≤1.0	≤1.0
IRON (AS Fe)	Mg/L	≤1.0	≤1.0	≤1.0	≤1.0	≤1.0	≤1.0	≤1.0	≤1.0
LEAD (AS Pb)	Mg/L	≤0.1	≤0.1	≤0.1	≤0.1	≤0.1	≤0.1	≤0.1	≤0.1
MANGANESE (AS Mn)	Mg/L	≤1.0	≤1.0	≤1.0	≤1.0	≤1.0	≤1.0	≤1.0	≤1.0
MERCURY (AS Hg)	μg/L	≤5.0	≤5.0	≤5.0	≤5.0	≤5.0	≤5.0	≤5.0	≤5.0
NICKEL (AS Ni)	Mg/L	≤1.0	≤1.0	≤1.0	≤1.0	≤1.0	≤1.0	≤1.0	≤1.0
PHOSPHOROUS (AS P)	Mg/L	≤1.0	≤1.0	≤1.0	≤1.0	≤1.0	≤1.0	≤1.0	≤1.0
SULFATE (SO_4) AS $CaCO_3$	Mg/L	5933	5933	5933	5933	5333	5933	5933	5933
TSS	Mg/L	≤15	≤15	≤15	≤15	≤15	≤15	≤15	≤15
TDS	Mg/L	7815	7815	7815	7815	7815	7815	7815	7815

DELETED 10-26-77 — DELETED 4-7-77 — DELETED 5-5-78

REVISIONS		
REV	DESCRIPTION	
A	ISSUED FOR INITIAL REVIEW	DATE 1-22-77
B	ISSUED FOR PROJECT REVIEW	3-25-77
C	RELEASED FOR ENGINEERING	4-7-77
	SYS. ENG.	
	LEAD ENG.	
	PROJ. ENG.	
	PROC. MGR.	
D	MISC. REVISIONS	
	SYS. ENG.	
	LEAD ENG.	
	PROJ. ENG.	
	PROC. MGR.	10-26-77
E	GEN. REVISIONS	
	SYS. ENGR.	
	LEAD ENGR.	
	PROJ. ENGR.	
	MECH. MGR.	3-27-78
F	GEN. REVISIONS	
	SYS. ENGR.	
	LEAD ENGR.	
	PROJ. ENGR.	
	MECH. MGR.	5-4-78
G	ISSUED FOR FINAL REVIEW BEFORE A.F.C.	
	SYS. ENGR:	
	LEAD ENGR:	
	MECH. ENGR:	

PARTS LIST

ITEM NO.	DESCRIPTION	SIZE	IDENTIFICATION MATERIAL	IDENTIFICATION PART NO. OR SPECIFICATION

FINAL INTERNAL REVIEW BEFORE A.F.C.

DESIGN	J.J.O. C. LEE
DRAWN	
CHECKED	
LEAD ENGINEER	
PROJECT MGR. APPR.	
APPROVAL	
APPROVAL	
APPROVAL PROJ.	
APPROVAL ENVIR.	

COMMONWEALTH EDISON COMPANY
WASTE WATER TREATMENT FACILITIES-WAUKEGAN
DEMINERALIZER WASTE EQUALIZATION SYS.
PROCESS FLOW DIAGRAM

ECS CONTRACT 802670 — ECS DWG. NO. — REV.

NUS CORPORATION ROCKVILLE MD — DRAWING NO. 5082ME3010 — SCALE AS NE — SHEET OF

83-28-22

07580000104

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5082ME3011 D

PARTS LIST

ITEM	DESCRIPTION	REQ'D	IDENTIFICATION: MATERIAL	IDENTIFICATION: PART NO. OR SPECIFICATION

REVISIONS

REV	DESCRIPTION
A	ISSUED FOR INITIAL REVIEW 1-11-77
B	ISSUED FOR PROJECT REVIEW 2-7-77 A T Chan 5-1-77
C	RELEASED FOR ENGINEERING SYS. ENGR. Geo LEAD ENGR. PROJ ENGR. MECH MGR. 5-24-77
D	REVISED DUE TO RETIREMENT OF UNIT 5. DELETED NOTES. ① ② ③ ④ ⑤ LEAD DSGN. SYSTEM ENGR. LEAD ENGR. PROJ ENGR. MECH MGR. 4-26-78

FROM H.P. SERVICE WATER-SLOPE WASH

FROM 7A & 7B ASH SLUICE PUMPS

UNIT 7 BOTTOM ASH HOPPERS

CLINKER GRINDER

U-7 JET PUMP

FROM H.P. SERVICE WATER

GAS SIDE | AIR SIDE

UNIT 7 AIR HEATERS

NEW C.O.

NEW ASH HOPPER OVERFLOW TANK

CAPACITY: 3250 GALS

NEW ASH HOPPER OVERFLOW PUMPS 1000 GPM AT 80' TDH

UNIT 7

FROM H.P. SERVICE WATER SLOPE WASH

FROM 8A & 8B ASH SLUICE PUMPS

UNIT 8 BOTTOM ASH HOPPERS

CLINKER GRINDER

U-8 JET PUMP

FROM H.P. SERVICE WATER

GAS SIDE | AIR SIDE

UNIT 8 AIR HEATER

NEW C.O.

NEW ASH HOPPER OVERFLOW TANK

CAPACITY: 3250 GALS.

NEW ASH HOPPER OVERFLOW PUMPS 1000 GPM AT 80' TDH.

BOTH UNITS 7 & 8 – LUNGSTRONS

NEW AIR HEATER BASKET WASH AREA 20'×20'

UNIT 8

TO WASTEWATER STORAGE TANK DWG. ME 3011-3 (D-7)

ASH PONDS

RELEASED FOR ENGINEERING

COMMONWEALTH EDISON COMPANY
WASTE WATER TREATMENT FACILITIES-WAUKEGAN

METAL CLEANING WASTE SYSTEM
PROCESS FLOW DIAGRAM

CECO CONTRACT 52670 | EECO JOB NO.

NUS CORPORATION ROCKVILLE MD | DRAWING NO. 5082ME3011 | SCALE NONE | SHEET 1 OF 1

83-3123

0758000010

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D 5082ME3011

PARTS LIST					
REF ITEM	DESCRIPTION	REQ'D	IDENTIFICATION		
			MATERIAL	PART NO. OR SPECIFICATION	

REVISIONS	
REV	DESCRIPTION
A	ISSUED FOR INITIAL REVIEW 1-11-77 C.R. Strieker
B	ISSUED FOR PROJECT REVIEW S Royden 2-7-77
C	RELEASED FOR ENGINEERING SYS. ENGR. [illegible] LEAD ENGR. [illegible] PROJ. ENGR. [illegible] MECH MGR. [illegible] 5-26-77
D	REVISED DUE TO RETIREMENT OF UNIT #5. DELETED LINE NOS. 8, 9, 10, 11, 12, 13, 14 LEAD DSGN. [illegible] SYS. ENGR. [illegible] COG. ENGR. [illegible] MECH. MGR. [illegible] PROJ. ENGR. 5-26-78

ANALYSIS	UNITS	STREAM NO. 1	2	3	4	5	6	7
AVERAGE FLOW	GPM	244	361	605	244	361	665	60
DESIGN FLOW	GPM	250	360	1000	250	360	1000	60
DESIGN FLOW	TOTAL GALS/WASH	480000	518,400	998,400	480000	518,400	1,084,800	86,400
TEMPERATURE	°F	AMB.	AMB.	AMB.	AMB.	AMB.	AMB.	AMB.
PRESSURE	PSIG	ATM.	ATM.	30	ATM.	ATM.	30	ATM.
FREQUENCY	PER YEAR	4	4.3	INTERMITTENT	4	4.3	INTERMITTENT	4 EA UNIT-B/YR.
DURATION	MINUTES	1920	1440	AS REQ'D.	1920	1440	AS REQ'D	1440
pH		8.0	8.0	5.0-8.0	8.0	8.0	5.0-8.0	6.0 - 8.0
TSS	% OF WT.	—	—	10,292	—	—	10,292	—
OIL & GREASE	Mg/l	0	—	≤15	0	—	≤15	0
IRON (TOTAL)	Mg/l	0.47	—	852	0.47	—	852	0.47
COPPER (TOTAL)	Mg/l	0.38	—	4.4	0.38	—	4.4	0.38
ZINC (TOTAL)	Mg/l	0.14	—	2.5	0.14	—	2.5	0.14
CHROMIUM (TOTAL)	Mg/l	0.14	—	2.1	0.14	—	2.1	0.14
PHOSPHORUS (TOTAL)	Mg/l	0.63	—	17.6	0.63	—	17.6	0.63
ARSENIC	Mg/l	—	—	0.83	—	—	0.83	—
LEAD	Mg/l	—	—	0.88	—	—	0.88	—
MANGANESE	Mg/l	—	—	6.2	—	—	6.2	—
MERCURY	Mg/l	—	—	0.8	—	—	0.8	—

DRAWING STATUS: RELEASED FOR ENGINEERING

DRAWN	C.R. Strieker	2/7/77
CHECKED	S Royden	2/7/77
COG. ENGINEER		
CHEM., MECH. ENGR.		
APPROVAL		
APPROVAL		
APPROVAL PROJ.		
APPROVAL CLIENT		

COMMONWEALTH EDISON COMPANY
WASTE WATER TREATMENT FACILITIES-WAUKEGAN
METAL CLEANING WASTE SYSTEM
PROCESS FLOW DIAGRAM

CO'S CONTRACT 80-2470 | E.O. UNIT NO. | REV.

NUS CORPORATION, ROCKVILLE, MD | DRAWING NO. 5082ME3011 | REV C | SCALE NONE | SHEET 6 OF 7

B3-32

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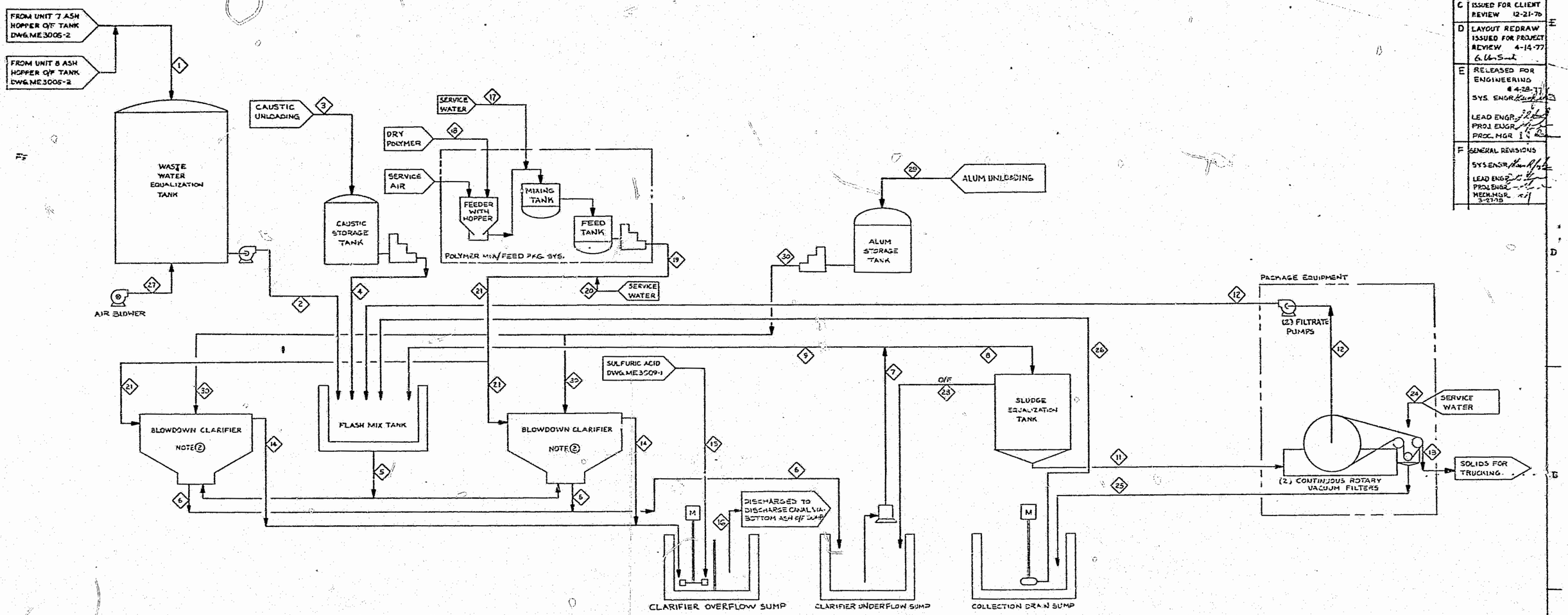
5082ME3011

REVISIONS	
REV	DESCRIPTION
A	INITIAL REVIEW 11-30-76
B	ISSUED FOR PROJECT REVIEW 12-7-76
C	ISSUED FOR CLIENT REVIEW 12-21-76
D	LAYOUT REDRAW ISSUED FOR PROJECT REVIEW 4-14-77 G. Van Sant
E	RELEASED FOR ENGINEERING 4-28-77 SYS. ENGR. LEAD ENGR. PROJ. ENGR. PROC. MGR.
F	GENERAL REVISIONS SYS. ENGR. LEAD ENGR. PROJ. ENGR. MECH. MGR. 3-27-78



ANALYSIS	UNITS	STREAM NO. 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
FLOW, MIN. NORM. ⑤	GPM	0	0	130	0	275	0	0	0	0		1415	115	13,793 ①	275	0	275	0	0	3.46	1.3	1.4			152	152	160	0	0	0	0
FLOW, MAX. NORMAL	GPM	1000-1100	1100	130	2.3	1500	1000	268.5	141.5	0		1415	115	13,793 ①	1236	5.0	1236	20.0	25 ①	3845	5.8	6.4			152	152	160	20 ⑥	1273	116	24.0 ⑤
FLOW DESIGN	GPM	1100 ⑧	1100	130	0-3	1540	1000	300	268.5	127.3		1415	150	8793 ①	1540	0-60 ③	1540	20.0	25 ①	0-60 ③	0-9	0-11			152	152	160	20 ⑥	127.3	116	3-33 ⑤
TOTAL DAILY FLOW MAX. NORMAL	GPD	1.584×10^6	1.584×10^6	3900	3312	2.124×10^5	384,640	386,640	203,760	182,880		203,760	165,600	2,116,800	1.771×10^6	134	1.771×10^6	1200	25 ①	922	8352	9274			218,880	218,880	218,880		182,880	-	2490
DURATION HRS/DAY	HRS	24	24	0.5	24	24	6.4	~24	24	24		24	24	24	~24	2.2	24	1	1	24	24	24			24	24	22.8	24	24	0	24
FREQUENCY		← INTERMITTENT →										← INTERMITTENT →													← INTERMITTENT →						
TEMPERATURE	°F	← AMBIENT →										← AMBIENT →													← AMBIENT →						
PRESSURE, NOM.	PSIG	150 MAX. 1 MIN.	5	30	12	4	ATM	41.1	ATM	ATM		ATM	25	ATM	ATM	15	60	60	-	ATM	-	-			-	ATM	25	18	ATM	30	5
pH		5-8	5-8	14	14	9.4	9.4	9.4	9.4	9.4		9.4	9.4	9.4	9.4		6-9	6-9	-	6-9	6-9	6-9			6-9	6-9	6-9	-	9.4	-	-
SPECIFIC GRAVITY NOTE (3)		1.01	1.01	1.53	1.53	1.02	1.08	1.08	1.08	1.08		1.08	1.0	1.30	1.0	1.82	1.0	1.0	-	1.0	1.0	1.0			1.0	1.0	1.0	-	1.08	1.3	1.3
ARSENIC (TOTAL)	Mg/L	0.83	0.83	-	-	1.5	6.5	6.5	6.5	6.5		6.5	NEGLIGIBLE	24.2	≤0.25	-	≤0.25	-	-	-	-	-			-	-	-	-	6.5	-	-
CHROMIUM (TOTAL)	Mg/L	2.1	2.1	-	+	3.8	16.3	16.3	16.3	16.3		16.3	NEGLIGIBLE	60.7	≤1.0	-	≤1.0	-	-	-	-	-			-	-	-	-	16.3	-	-
COPPER (TOTAL)	Mg/L	4.4	4.4	-	-	7.9	34.2	34.2	34.2	34.2		34.2	NEGLIGIBLE	127.3	≤1.0	-	≤1.0	-	-	-	-	-			-	-	-	-	34.2	-	-
IRON (TOTAL)	Mg/L	852	852	-	-	1,537	6623	6623	6623	6623		6623	NEGLIGIBLE	24,662	≤1.0	-	≤1.0	-	-	-	-	-			-	-	-	-	6623	-	-
LEAD (TOTAL)	Mg/L	0.88	0.88	-	-	1.6	6.8	6.8	6.8	6.8		6.8	NEGLIGIBLE	25.3	≤0.1	-	≤0.1	-	-	-	-	-			-	-	-	-	6.8	-	-
MANGANESE (TOTAL)	Mg/L	6.2	6.2	-	-	11.2	48.2	48.2	48.2	48.2		48.2	NEGLIGIBLE	179.5	≤1.0	-	≤1.0	-	-	-	-	-			-	-	-	-	48.2	-	-
MERCURY (TOTAL)	Mg/L	0.6	0.6	-	-	1.4	6.2	6.2	6.2	6.2		6.2	NEGLIGIBLE	23.1	≤0.5	-	≤0.5	-	-	-	-	-			-	-	-	-	6.2	-	-
OIL & GREASE	Mg/L	<15	<15	-	-	<15	0	0	0	0		0	NEGLIGIBLE	0	<15	-	<15	-	-	-	-	-			-	-	-	-	0	-	-
PHOSPHORUS	Mg/L	17.6	17.6	-	-	31.8	137	137	137	137		137	NEGLIGIBLE	510	≤1.0	-	≤1.0	-	-	-	-	-			-	-	-	-	137	-	-
ZINC (TOTAL)	Mg/L	2.5	2.5	-	-	4.5	19.4	19.4	19.4	19.4		19.4	NEGLIGIBLE	72.2	≤1.0	-	≤1.0	-	-	-	-	-			-	-	-	-	19.4	-	-
TSS	Mg/L	10,292	10,292	-	-	18,872	80,000	80,000	80,000	80,000		80,000	300	300,000	100	-	100	-	-	-	-	-			15	30	300	-	80,000	-	-

STREAM DELETED 12-20-77

STREAM DELETED 12-20-77

NOTES:
① POUNDS PER HOUR
② ONLY ONE CLARIFIER REQUIRED FOR MCW OPERATION
③ IN SCFM
④ THERE IS NO O/F FROM SLUDGE HOLDING TANK WHEN STREAM 9 IS 127.3 GPM. WHEN STREAM 9 IS 0, STREAM 28 GOES TO 127.3 GPM.
⑤ MAX. FLOW IS 1000-1100 GPM. DESIGN FLOW IS 1100 GPM.
⑥ GALLONS PER HOUR
⑦ SYSTEM IS SIZED TO HANDLE ONE AIR HEATER WASH AT THE TIME.
⑧ MINIMUM FLOW 3 TAKEN AS VACUUM FILTERS AND COLLECTION DRAIN SUMP PUMP OPERATING WITH THE REST OF THE SYSTEM SHUT OFF.

DRAWING STATUS
RELEASED FOR ENGINEERING

DRAWN O.R. Strube 4-28-77
CHECKED 4-28-77
CODE ENGINEER
DESIGN MGR. APPVL.
APPROVAL
APPROVAL
APPROVAL, PROJ.
APPROVAL, CLIENT

COMMONWEALTH EDISON COMPANY
WASTE WATER TREATMENT FACILITIES-WAUKEGAN
METAL CLEANING WASTE SYSTEM
PROCESS FLOW DIAGRAM
SPECIFICATION 802670
NUS CORPORATION ROCKVILLE, MD
DRAWING NO. 5082ME3011
SCALE: NONE
SHEET 1 OF 1

87-2925

07580000107

MICROFILM

Electronic Filing: Received, Clerk's Office 10/31/2022

5082ME3012 B

REVISIONS	
REV	DESCRIPTION
A	ISSUED FOR INITIAL REVIEW 2-16-77
B	LAYOUT REDRAWN ISSUED FOR PROJECT REVIEW STR. ENGR. MECH. ENGR.

DISCHARGE TUNNEL BLOCKED

EXISTING FLOW

EXISTING CROSS CONNECTION

EXISTING UNITS 1 & 2 DISCHARGE TUNNEL

EXISTING UNITS 3 & 4 DISCHARGE TUNNEL

(1) UNIT 1 CONDENSER PIT (FLOOR AND EQUIPMENT DRAINS) — EXIST. PUMPS 250 GPM @ 18' T.D.H. — EXIST. COND. SUMP PIT (9'-8" x 5'-3" x 5'-10" DP.) (1200 GALS)

(2) UNIT 2 CONDENSER PIT FLOOR AND EQUIPMENT DRAINS — EXIST. PUMPS 250 GPM @ 18 FT. T.D.H. — EXIST. COND. SUMP PIT (5'-0" x 5'-10" x 6'-3" DP.) (1350 GALS)

(3) UNIT 3 CONDENSER PIT (FLOOR AND EQUIPMENT DRAINS) — EXIST. PUMPS 250 GPM @ 25' TDH. — EXIST. COND. SUMP PIT (5'-3" x 6'-0" x 8'-8" DP.) (2050 GALS)

(4) UNIT 4 CONDENSER PIT (FLOOR AND EQUIPMENT DRAINS) — EXIST. PUMPS 250 GPM @ 25' T.D.H. — EXIST. C.W.D. SUMP PIT (5'-3" x 6'-0" x 8'-2" DP.) (1925 GALS)

(5) UNIT 1 FLOOR DRAINS

(6) UNIT 2 FLOOR DRAINS

(7) UNIT 3 FLOOR DRAINS

(5) UNIT 4 FLOOR DRAINS

ROOF DRAINS (9)

ROOF DRAINS (10)

ROOF DRAINS (11)

ROOF DRAINS (12)

(13) UNIT 6 BOILER ROOM FLOOR DRAINS — 16FD-155-PA&PB 250 GPM @ 33' T.D.H. — EXIST. SUMP PIT (8'-3" x 8'-3" x 15'-8" DP.) (5435 GALS)

(14) UNIT 7 & 8 OILY WATER TURBINE & EQUIPMENT DRAINS — 16FD-156-PA&PB 250 GPM @ 35' TDH. — EXIST. SUMP PIT (21' x 24' x 10' DP) (37,700 GALS)

(15) UNIT 8 BOILER ROOM FLOOR DRAINS — 16FD-157-PA&PB 250 GPM @ 30' T.D.H. — 16FD-125-N NEW CONCRETE SUMP PIT 8' x 4'-5" DP. - 1200 GALS.

(6) UNIT 5 CONDENSER PIT - FLOOR & EQUIPMENT DRAINS AND TURBINE ROOM DRAINS — 16FD-148-PA&PB 450 GPM @ 34' T.D.H. — EXIST. SUMP PIT (5'-2" x 7'-0" x 8'-8" DP.) (2350 GALS.)

(7) UNIT 6 CONDENSER PIT DEGASSER BILGE & TURBINE ROOM DRAINS — 16FD-149-PA&PB 250 GPM @ 34' T.D.H. — EXIST. SUMP PIT (7'-8" x 10'-0" x 10'-8" DP.) (6120 GALS)

(8) UNIT 7 TURBINE ROOM BILGE - AUX. SWITCH GEAR & EQUIPMENT DRAINS — 16FD-150-PA&PB 100 GPM @ 30' T.D.H. — EXIST. SUMP PIT (4'-0" x 6'-0" x 8'-0" DP.) (1436 GALS)

(9) UNIT 8 - CIRCULATING WATER PUMP DRAINAGE — 16FD-151-PA&PB 350 GALS. @ 50' T.D.H. — EXIST. SUMP PIT (4'-0" DIA. x 5'-0" DP.) (565 GALS)

(10) UNITS 5 & 6 CRIB HOUSE FLOOR & EQUIPMENT DRAINS — 16FD-152-PA&PB 250 GPM @ 40' T.D.H. — EXIST. SUMP PIT (5'-4" x 7'-4" x 5'-6" DP.) (1610 GALS)

(12) UNIT 5 BOILER ROOM FLOOR & EQUIPMENT DRAINS — 16FD-154-PA&PB 100 GPM @ 28' T.D.H. — 16FD-113-N NEW CONC. SUMP PIT (8'-0" x 8'-0" x 6'-0" DP.) (2875 GALS.)

(16) TURBINE OIL STORAGE ROOM DRAINS — 16FD-147-PA&PB NEW SUMP PUMPS 250 GPM @ 35' T.D.H — FLOOR DRAINS — EXIST. SUMP 4'x5'x4" DP. 600 GALS — EXIST. SUMP 3'x5'x4" DP. 450 GALS — DRAINS

(17) UNIT 8-PULVERIZER LINE FLOOR DRAINS — 16FD-153-PA&PB 100 GPM @ 28' TDH — 16FD-112-N NEW CONC. SUMP (4'-0" x 4'-0" x 4'-0" DP) (500 GALS)

ROOF DRAINS (24) → (22) TO EAST YARD RUN-OFF BASIN 16FY-108-N

HIGH ELEVATION FLOOR DRAINS (25) → (22)

(27) TO EAST RUN-OFF BASIN 16FY-108-N

16FD-137-PA&PB VERT CENT PUMPS 1000 GPM @ 20 FT. T.D.H.

(30) PRECIPITATOR AREA YARD DRAINS DWG. ME3008-2(C-1)

OIL SEPARATOR EFFLUENT DWG. ME3012-2 (C-1) (29)

(23) TO FLOOR DRAINS SURGE TANK DWG. ME3012-(E-7) SHEET-2

NOTES:
1. LINES (1) THRU (12) EQUAL TOTAL FLOW THRU LINE (21)
2. LINES (3) THRU (23) PLUS (28) EQUAL TOTAL FLOW THRU LINE (29)
3. LINE (24) (25) EQUAL TOTAL FLOW THRU LINE (26)

STREAM NO.	(5)
	WATER & OIL
2.037	
INT.	
INT.	
AMB.	
0	
178,200	
6-9	
<1%	
50	

ANALYSIS	UNITS	STREAM NO. (1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)	(23)	(24)	(25)	(26)	(27)	(28)	(29)
CONTAINMENT	DESCRIPTION	WASTE WATER	WASTE WATER	WASTE WATER	WASTE WATER	WASTE WATER	WASTE WATER	WASTE WATER	WASTE WATER	RAIN	RAIN	RAIN	RAIN	WATER & OIL	WATER & OIL	WATER & OIL	WATER & OIL	WATER & OIL	WATER OIL - ASH	WATER & OIL	WATER & OIL	WATER & OIL	WATER & OIL	WATER & OIL	WATER & OIL	WATER & ASH	WATER & OIL	WATER & OIL	WATER & OIL	WATER & OIL
DESIGN FLOW	GPM	250	250	250	250	1	2	2	2	40	43	55	55	250	450	250	100	350	250	250	250	100	250	2400	6000	1	4001	1000	100	450
FREQUENCY	PER DAY	←												INTERMITTENT																
DURATION	MINUTES	4	3	1	½	1440	1440	1440	1440	1440	1440	1440	1440	10	5.4	10+	216	229	360	INTERM	5	14+	120	INT.	INT.	1440	INT.	INT.	INT.	INT.
TEMPERATURE	°F	←												AMBIENT																
PRESSURE	T.D.H	18'	18'	25'	25'	←				GRAVITY				Gr.	Gr.	Gr.	Gr.	Gr.	Gr.	Gr.	Gr.	Gr.	Gr.	Gr.	200'	180'	200'	20'	Gr.	0
TOTAL FLOW	GPD	1000	750	250	4000	1500	3000	3000	3000	62,500	62,000	80,000	83,300	15,000	28,300	26,000	21,300	80,150	90,000	5,000	1250	14,400	33,300	522,100	INT.	1440	INT.	998,700	7,200	520,000
pH		6-8	6-8	6-8	6-8	6-8	6-8	6-8	6-8	NEUT.	NEUT.	NEUT.	NEUT.	6-8	6-8	6-8	6-8	6-8	6-8	6-8	6-8	6-8	6-8	6-8	7.0	6-8	6-8	6-8	6-8	6-9
T.S.S	% BY WT.	<1%	<1%	<1%	<1%	<1%	<1%	<1%	<1%	<1%	<1%	<1%	<1%	<1%	<1%	<1%	<1%	<1%	<1%	<1%	<1%	<1%	<1%	<1%	<1%	<1%	<1%	1%	<1%	<1%
OIL & GREASE	Mg/l	50	50	50	50	50	50	50	50	50	50	50	50	100	100	100	100	100	100	100	100	100	100	100	100	100	0	100	10	

PRELIMINARY

COMMONWEALTH EDISON COMPANY
WASTE WATER TREATMENT FACILITIES-WAUKEGAN
BUILDING PLUMBING & FLOOR DRAINS
PROCESS FLOW DIAGRAM

NUS CORPORATION ROCKVILLE, MD — DRAWING NO. 5082ME3012 REV. B — SCALE ~ — SHEET 1 OF 2

8-3-30 26

07580001108
MICROFILM

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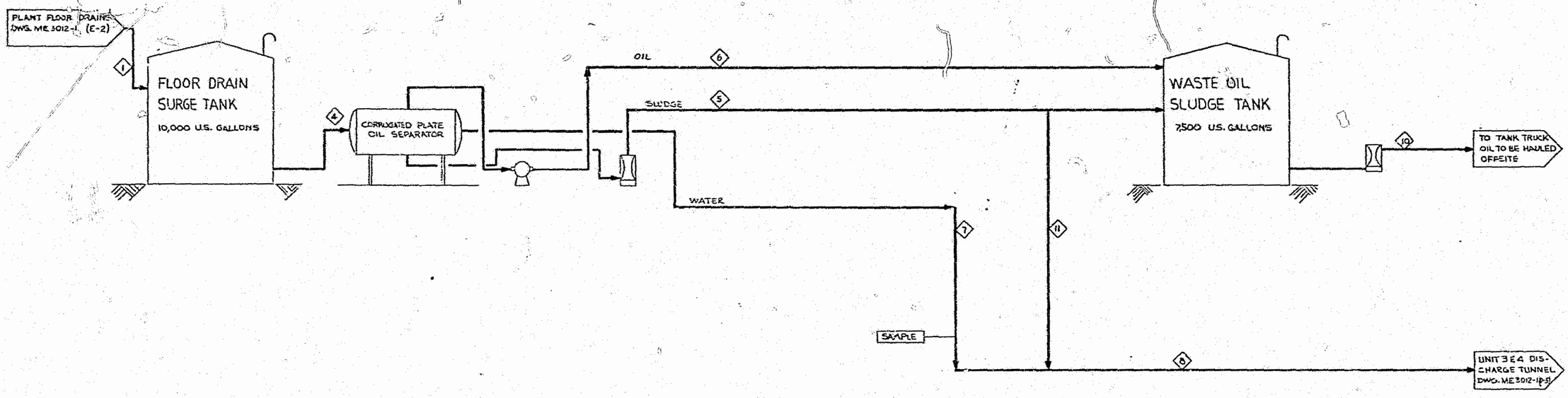
5082ME3012 E

PARTS LIST				
REF ITEM	DESCRIPTION	REQ'D	IDENTIFICATION MATERIAL	IDENTIFICATION PART NO. OR SPECIFICATION

REVISIONS	
REV	DESCRIPTION
A	ISSUED FOR INITIAL REVIEW O.R. Strieker 1-17-77
B	ISSUED FOR PROJECT REVIEW R.L.H. 4/6/77
C	RELEASED FOR ENGINEERING 4-18-77 SYS. ENGR. S Land LEAD ENGR. PROJ. ENGR. PROC. MGR.
D	GENERAL REVISIONS SYS. ENGR. S Land LEAD ENGR. PROJ. ENGR. PROC. MGR. 10-7-77
E	GENERAL REVISIONS SYS. ENGR. LEAD ENGR. PROJ. ENGR. MECH. MGR.



ANALYSIS	UNITS	STREAM NO. 1	4	5	6	7	8	10	11
FLOW, NORMAL	GPM	450	450	—	—	450	450	50	—
FLOW, MAXIMUM	GPM	2600	1000	20	20	1000	1000	50	20
FLOW, DESIGN	GPM	1000	1000	20	20	1000	1000	50	20
TOTAL DAILY FLOW	GPD	522,000	522,100	2046	54	520,000	523,000	5000	—
DURATION	HRS.	24	24	1.833	.045	24	24	1	WHEN REQ'D
FREQUENCY		INTER.	←		INTERMITTENT		→	TWICE/WEEK	BY P.O.E.
TEMPERATURE	°F	AMB.	←		AMBIENT		→	AMBIENT	
PRESSURE	PSIG	1-5	1-5	35	35	2	0	5-30	35
PH		6-8	6-8	6-8	6-8	6-8	6-8	6-8	6-8
OIL & GREASE	Mg/l	100	100	—	8×10^5	50	50	6000	—
OIL & GREASE	Lbs/DAY	434	434	—	345	216	216	2625	—
TSS	Mg/l	500	500	1×10^5	—	100	100	1×10^5	1×10^5
SOLIDS	Lbs/DAY	2175	1742	1742	—	433	433	4200	—
SPECIFIC GRAVITY		1.0	1.0	1.2	0.8	1.0	1.0	0.9	1.2

RELEASED FOR ENGINEERING

COMMONWEALTH EDISON COMPANY
WASTEWATER TREATMENT FACILITIES-WAUKEGAN
BUILDING, PLUMBING, & FLOOR DRAINS PROCESS FLOW DIAGRAM

NUS CORPORATION — DRAWING NO. 5082ME3012 — REV. — SCALE: NONE

83-3327

07580000109
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5082 ME 3012 B

A	PROJECT REVIEW 3-9-78
B	RELEASED FOR ENGINEERING
	SYS. ENGR.
	LEAD ENGR.
	PROJ. ENGR.
	MECH. MGR.
	CIVIL ENGR.

UNIT 1 BOILER ROOF DRAINS (6 DRAINS) — 458 GPM
UNIT 1 TURBINE ROOF DRAIN (1 DRAIN) — 96 GPM
UNIT 2 TURBINE ROOF DRAIN (1 DRAIN) — 96 GPM
UNIT 2 BOILER ROOF DRAINS (4 DRAINS) — 550 GPM

→ UNITS 1 & 2 DISCHARGE TUNNEL

UNIT 3 TURBINE ROOF DRAIN (1 DRAIN) — 96 GPM
UNIT 4 TURBINE ROOF DRAIN (1 DRAIN) — 80 GPM
UNIT 4 TURBINE ROOF DRAIN (1 DRAIN) — 80 GPM
UNIT 4 TURBINE ROOF DRAINS 5 (2 DRAINS) — 48 GPM
UNIT 4 TURBINE ROOF DRAINS (2 DRAINS) — 122 GPM
UNITS 3 & 4 BOILER ROOF DRAINS (2 DRAINS) — 100 GPM
UNIT 4 BOILER ROOF DRAINS (7 DRAINS) — 644 GPM
UNIT 5 BOILER AREA ROOF DRAINS (5 DRAINS) — 293 GPM
UNIT 5 TURBINE AREA ROOF DRAINS (7 DRAINS) — 353 GPM
UNIT 5 BOILER & TURBINE AREA ROOF DRAINS (2 DRAINS) — 115 GPM
UNIT 5 BOILER AREA ROOF DRAINS (5 DRAINS) — 509 GPM
UNIT 5 BOILER & TURBINE AREAS ROOF DRAINS (28 DRAINS) — 1694 GPM
UNIT 6 BOILER AREA & U5 AREA & TURBINE AREA ROOF DRAINS (9 DRAINS) — 75[illegible] GPM
UNIT 6 BOILER & TURBINE AREAS ROOF DRAINS (7 DRAINS) — 1151 GPM
MACHINE SHOP ROOF DRAINS (2 DRAINS) — 310 GPM
UNIT 3 BOILER AREA ROOF DRAIN (1 DRAIN) — 180 GPM
UNIT 2 TURBINE AREA ROOF DRAINS (3 DRAINS) — 645 GPM
UNIT 3 & 4 TURBINE AREA ROOF DRAINS (3 DRAINS) — 504 GPM
UNIT 5 TURBINE AREA ROOF DRAIN (1 DRAIN) — 96 GPM

621 GPM → 1174 GPM → 1427 GPM → 3121 GPM → 3375 GPM

1269 GPM → 1375 GPM

2292 GPM
TOTAL FLOW: 68,760 GALLONS → WEST YARD RUNOFF BASIN

UNIT 6 TURBINE AREA ROOF DRAINS (4 DRAINS) — 316 GPM
UNIT 6 TURBINE AREA ROOF DRAINS (3 DRAINS) — 237 GPM
UNITS 5 & 6 TURBINE AREA ROOF DRAINS (2 DRAINS) — 94 GPM

553 GPM → 817 GPM

YARD RUNOFF
TOTAL FLOW= 95,000 GALLONS

→ OUTSIDE YARD BILGE SUMP PUMPS — 7000 GPM (MAX.)

TOTAL FLOW 335,930 GALLONS

5000 GPM
500 GPM

→ EAST YARD RUNOFF BASIN

NOTES:

1 FLOWS SHOWN ARE THE CALCULATED PEAK FLOWS DURING A 10 YEAR, 24 HOUR STORM.

RELEASED FOR ENGINEERING

DRAWN	R.E. WILLIAMS
DETAILED	
CHK. ENGINEER	
GROUP REP. APPVL.	
APPROVAL	
APPROVAL	
APPROVAL PROJ.	
APPROVAL CLIENT	

COMMONWEALTH EDISON COMPANY
WASTE WATER TREATMENT FACILITIES - WAUKEGAN

ROOF DRAINS PROCESS FLOW DIAGRAM

CECO JOB NO.	M1370	CECO DWG. NO.	REV.
SARGENT & LUNDY CORPORATION	ROCKVILLE MD	5082 ME 3012	B
SCALE NONE	SHEET 3 OF 3		

83-3428

07580000110

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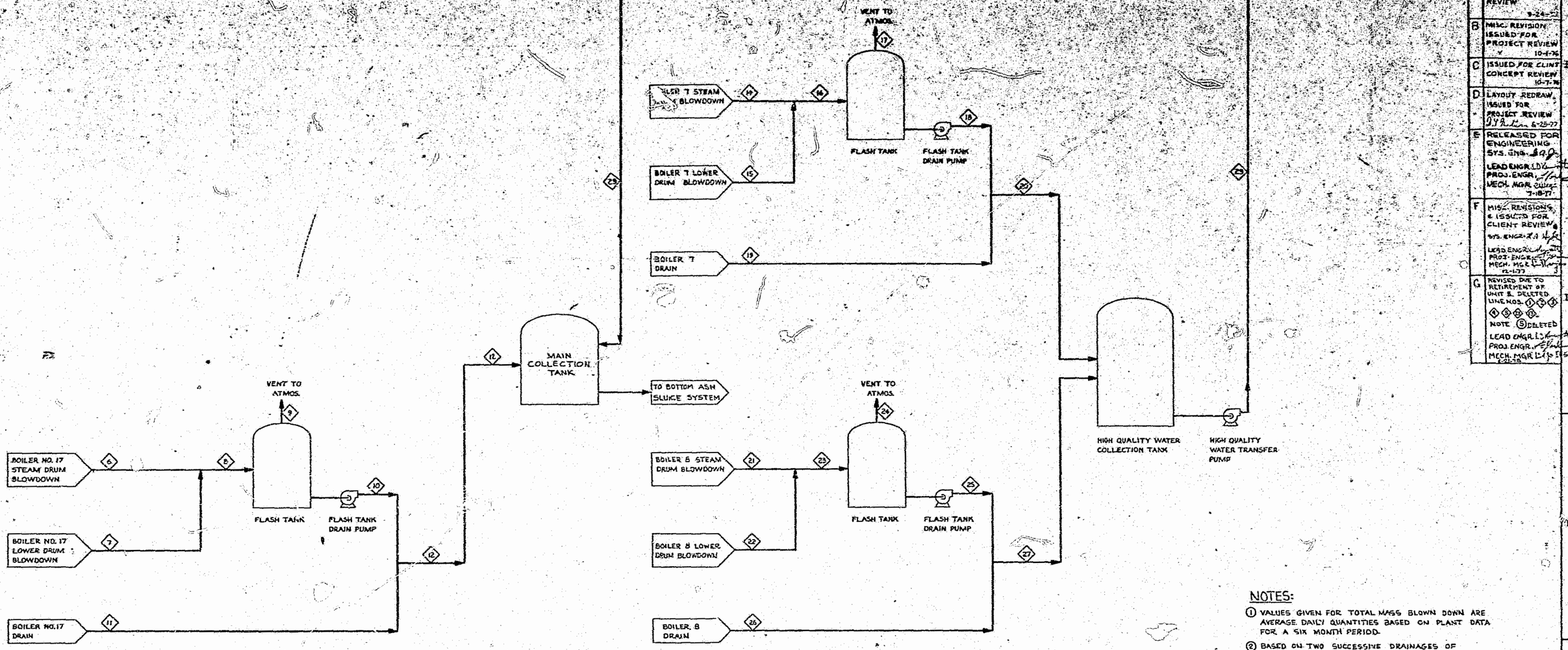
5082 ME 3013

REVISIONS	
A	ISSUED FOR INITIAL REVIEW 9-24-76
B	MISC. REVISION ISSUED FOR PROJECT REVIEW 10-4-76
C	ISSUED FOR CLINT CONCEPT REVIEW 10-7-76
D	LAYOUT REDRAW, ISSUED FOR PROJECT REVIEW 6-25-77
E	RELEASED FOR ENGINEERING SYS. ENG. LEAD ENGR. PROJ. ENGR. MECH. MGR. 7-18-77
F	MISC. REVISIONS & ISSUED FOR CLIENT REVIEW SYS. ENGR. LEAD ENGR. PROJ. ENGR. MECH. MGR. 12-1-77
G	REVISED DUE TO RETIREMENT OF UNIT 8, DELETED LINE NOS. 1 2 4 5 6 8, NOTE 5 DELETED LEAD ENGR. PROJ. ENGR. MECH. MGR. 2-21-78



NOTES:

1. VALUES GIVEN FOR TOTAL MASS BLOWN DOWN ARE AVERAGE DAILY QUANTITIES BASED ON PLANT DATA FOR A SIX MONTH PERIOD.
2. BASED ON TWO SUCCESSIVE DRAINAGES OF BOILER NO. 17.
3. BASED ON TWO SUCCESSIVE DRAINAGES OF BOILER NO. 7.
4. BASED ON TWO SUCCESSIVE DRAINAGES OF BOILER NO. 8.

ANALYSIS	UNITS	STREAM NO. 6	7	8	9	10	11	12	14	15	16	17	18	19	20	21	22	23	24	25	26	27	29
FLOW, DESIGN	GPM	70	162	162	—	51	500	500	102	170	170	—	48	1,250	1,250	92	170	170	—	48	1,250	1,250	300
FLOW, DESIGN	LBS/HR	21,500	50,000	50,000	25,700	24,300	—	—	30,000	50,000	50,000	26,900	25,100	—	—	27,000	50,000	50,000	26,900	23,100	—	—	—
FLOW, MAX.	LBS/HR	21,500	50,000	50,000	25,700	24,300	—	—	30,000	50,000	50,000	26,900	25,100	—	—	27,000	50,000	50,000	26,900	23,100	—	—	300 GPM
TOTAL MASS	LBS.	—	—	18,000 ①	6,680 ①	6,320 ①	300,000	600,000	—	—	45,000 ②	24,210 ②	20,790 ②	347,000	694,000	—	—	49,300 ③	26,350 ③	22,640 ④	340,000	680,000	694,000
TEMPERATURE	°F	640	640	640	212	212	<150	212	656	656	654	212	212	<150	212	652	656	654	212	212	<150	212	<195
PRESSURE	PSIG	2050	2050	2050	0	15	<100	<100	2250	2250	2250	0	20	<100	<100	2250	2250	2250	0	20	<100	<100	35
FREQUENCY		ONCE IN 3-4 DAYS	ONCE IN 3-4 DAYS	ONCE IN 3-4 DAYS	ONCE IN 3-4 DAYS	ONCE IN 3-4 DAYS	EA BOILER EA 3-4 DAYS	EA BOILER EA SYSTEM	ONCE IN 3-4 DAYS	ONCE IN 3-4 DAYS	ONCE IN 3-4 DAYS	ONCE IN 3-4 DAYS	ONCE IN 3-4 DAYS	EA BOILER EA SYSTEM	EA BOILER EA SYSTEM	ONCE IN 3-4 DAYS	ONCE IN 3-4 DAYS	ONCE IN 3-4 DAYS	ONCE IN 3-4 DAYS	ONCE IN 3-4 DAYS	EA BOILER EA SYSTEM	EA BOILER EA SYSTEM	—
DURATION	HRS.	4-8 HRS	4-8 HRS	4-8 HRS	4-8 HRS	4-8 HRS	3½	3½	4-8 HRS	4-8 HRS	4-8 HRS	4-8 HRS	4-8 HRS	3½	3½	4-8 HRS	4-8 HRS	4-8 HRS	4-8 HRS	4-8 HRS	3½	3½	—
PH		10.5-11	10.5-11	10.5-11	—	10.5-11	10.5-11	10.5-11	9.5-10	9.5-10	9.5-10	—	9.5-10	9.5-10	9.5-10	9.5-10	9.5-10	9.5-10	—	9.5-10	9.5-10	9.5-10	9.5-10
TSS	Mg/L	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
OIL & GREASE	Mg/L	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
IRON	Mg/L	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
COPPER	Mg/L	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
ZINC	Mg/L	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
CHROMIUM	Mg/L	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
PHOSPHATE	Mg/L	10-50	10-50	10-50	—	21-103	10-50	10-103	2-5	2-5	2-5	—	43-108	2-5	2-10.8	5-10	5-10	5-10	—	15-22	5-10	5-22	2-22
TDS	Mg/L	<300	<300	<300	—	<620	<300	<620	450	450	450	—	<108	<50	<108	<50	<50	<50	—	<108	<50	<108	<108
SILICA	Mg/L	<1.0	<1.0	<1.0	—	<2.1	<1.0	<2.1	<0.6	<0.6	<0.6	—	41.3	<0.6	<1.3	<0.6	<0.6	<0.6	—	<1.3	<0.6	<1.3	<1.3
SULFITE	Mg/L	2-5	2-5	2-5	—	4.1-10	2-5	2-10	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
SULFATE	Mg/L	30-250	50-250	50-250	—	103-515	50-250	50-515	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

RELEASED FOR ENGINEERING

COMMONWEALTH EDISON COMPANY
WASTE WATER TREATMENT FACILITIES WAUKEGAN
HIGH QUALITY BOILER WATER REUSE SYSTEM
PROCESS FLOW DIAGRAM

CECO CONTRACT 802670
NUS CORPORATION ROCKVILLE, MD.
DRAWING NO. 5082 ME 3013
SCALE NONE
SHEET 1 OF 1
REV G

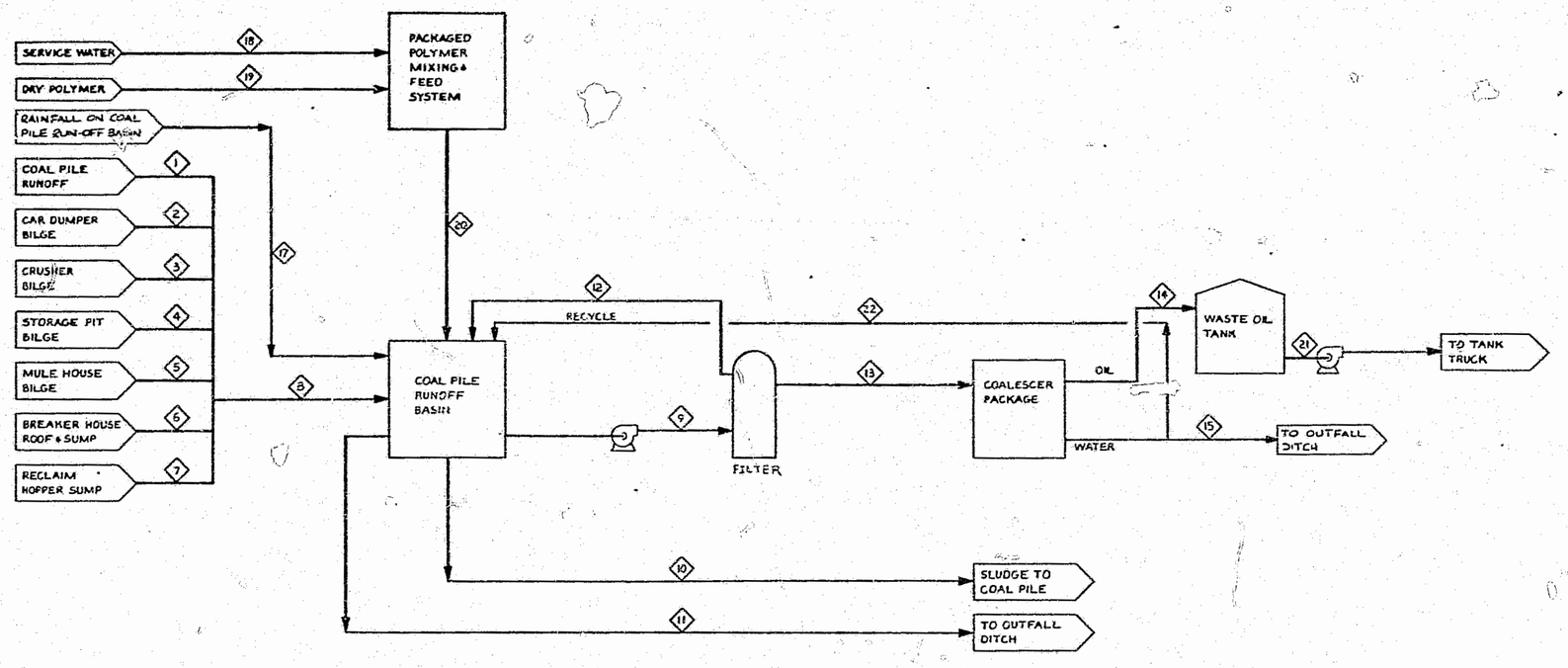
83-8329
07580000111
MICROFILM

Electronic Filing: Received, Clerk's Office 10/31/2022

5082ME3014 REV G

REF ITEM	DESCRIPTION	REQ'D	IDENTIFICATION: MATERIAL	IDENTIFICATION: PART NO. OR SPECIFICATION

REV	DESCRIPTION
A	ISSUED FOR INITIAL REVIEW 10-28-76
B	MISC. REVISIONS ISSUED FOR PROJECT REVIEW 11-9-76 AG AKG
C	ISSUED FOR CLIENT CONCEPT REVIEW 11-16-76 SYS ENGR. S Lorenz COG ENGR. JR Hamburg P.E. [illegible]
D	ISSUED FOR PROJECT REVIEW 3-1877 G 4-5-77
E	RELEASED FOR ENGINEERING 4-7-77 SYS. ENG S/T Lorenz LEAD ENG. J R Hamburg PROJ. ENG. [illegible] PROC. MGR [illegible]
F	GBU REVISIONS SYS. ENG. S/T Lorenz LEAD ENG. J R Hamburg PROJ. ENG. [illegible] PROC. MGR. [illegible] 10-12-77
G	GENERAL REVS SYS. ENGR: P Lorenz LEAD ENGR: [illegible] PROJ ENGR: [illegible] MECH. MGR: [illegible] 5-9-78



COAL PILE RUN-OFF

ANALYSIS	UNITS	STREAM Nº 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	◇	17	18	19	20	21	22
FLOW COMB. MAX	GPM	13500	20	20	20	20	20	280	13480	750	–	6732	150	750	–	750		–	–	–	56	–	750
FLOW NORMAL	GPM	750	20	20	20	20	20	225	762	500	–	0	100	500	2	500		110	15		0.33	25	500
FLOW MINIMUM	GPM	0	0	0	0	0	0	0	0	0	–	0	0	0	0	0		0	–	–	0	0	0
TOTAL DAILY FLOW	GPD	1080000	600	600	600	600	600	13500	1094400	720000	–	UNFILTERED	3000	720000	36	12 040		33 600	–	–	480	500	717300
DAILY DURATION	HRS/DAY	24 HRS	.5	5	.5	.5	.5	1	24	24	CLEANING OF FILTER	BACKWASH & FILLER	.5	24	.3	24		24	1	–	24	33	EFFLUENT 30D
FREQUENCY		◄				INTERMITTENT			►			1/DAY	BACKWASH	SEMI-C	INT.	INT.		INT	I/DAY	I/DAY	INT.	H/YR	SEQ.
TEMPERATURE	°F	AMB.	AMB.	AMB.	AMB.	AMB.	AMB.	AMB.	AMB.	AMB.	–	AMB	AMB.	AMB.	AMB	AMB		AMB	AMB.	–	AMB	AMB.	AMB.
PRESSURE	PSIG	0	0	0	0	0	0	0	0	55	0	–	5	30	5	2		0	–	–	10	2	2
PH		7.9	7.9	7.9	7.9	7.9	7.9	7.9	7.9	7.9	–	7.9	7.9	7.9	–	7.9		6-9	7	–	–	–	7-9
TSS	MG/L	1500								20	–	–	3400	5	–	15		–	–	–	2500	–	>15
TSS	LBS/DAY	30.0	20	20	20	20	20	338	9150	120	39400	–	95	30	–	90		–	–	10	10	–	–
MATERIAL		STORM WATER							►	OILY WATER	EMULSIFIED OIL	BACKWASH WATER	OILY & EMULSIFIED WATER		OILY WATER	OIL CLEAR WATER		SANITARY WATER	CHEMICAL WATER	POLYMER	SLUDGE SOLUTION	OIL	SLUDGE WATER
OIL	MG/L	50								45	–	–	50	45	8×10^5	15					–	6×10^5	>10
OIL	LBS/DAY	450	–	–	–	–	–	6	456	300	–	–	–	300	240	90					–	3350	
ANNUAL FLOW	GAL/YR	9.9×10^8	2.9×10^5	2.9×10^5	2.9×10^5	2.9×10^5	2.9×10^5	6.9×10^6	5.3×10^8	4.6×10^8	15.140	–	1.5×10^8	4.6×10^8	546	4.6×10^8		1.3×10^7	1.4×10^5	–	6640	546	–
SOLIDS	LBS/YR	16425	327	1825	327	327	1825	– 327	2497	2770	7127	–	2190	6570	–	2190		–	–	38	438	–	–
OIL	LBS/YR	2190	91	91	91	91	91	1643	2318	1314	53	–	24	1314	5.48	2190		–	–	–	–	1460	–

NOTES:

① BACKWASHING IS DONE WHEN THE PRESSURE DROP ACROSS THE FILTER REACHES A PRESET LIMIT, AND TAKES 1-2 MINUTES EVERY HOUR

DRAWING STATUS: RELEASED FOR ENGINEERING

DRAWN J.R. Zeender 10-28-76
CHECKED
COG. ENGINEER
DESIGN WORK APPVL.
APPROVAL
APPROVAL
APPROVAL PROJ.
APPROVAL CLIENT

COMMONWEALTH EDISON COMPANY
WASTE WATER TREATMENT FACILITIES-WAUKEGAN
COAL PILE, ROOF & YARD RUNOFF PROCESS FLOW DIAGRAM
P.E. CONTRACT 80470 FILE NO.
NUS CORPORATION ROCKVILLE MD
DRAWING NO. 5082ME3014 REV G
SHEET OF

1 8 3 35 30

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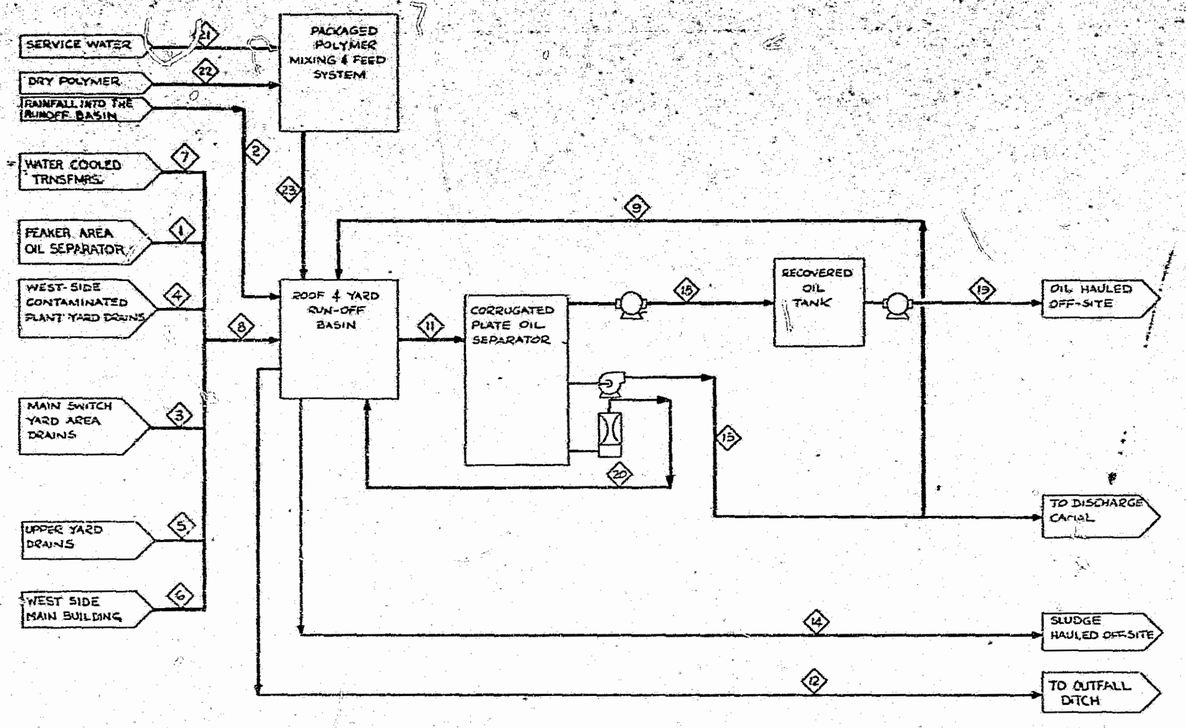
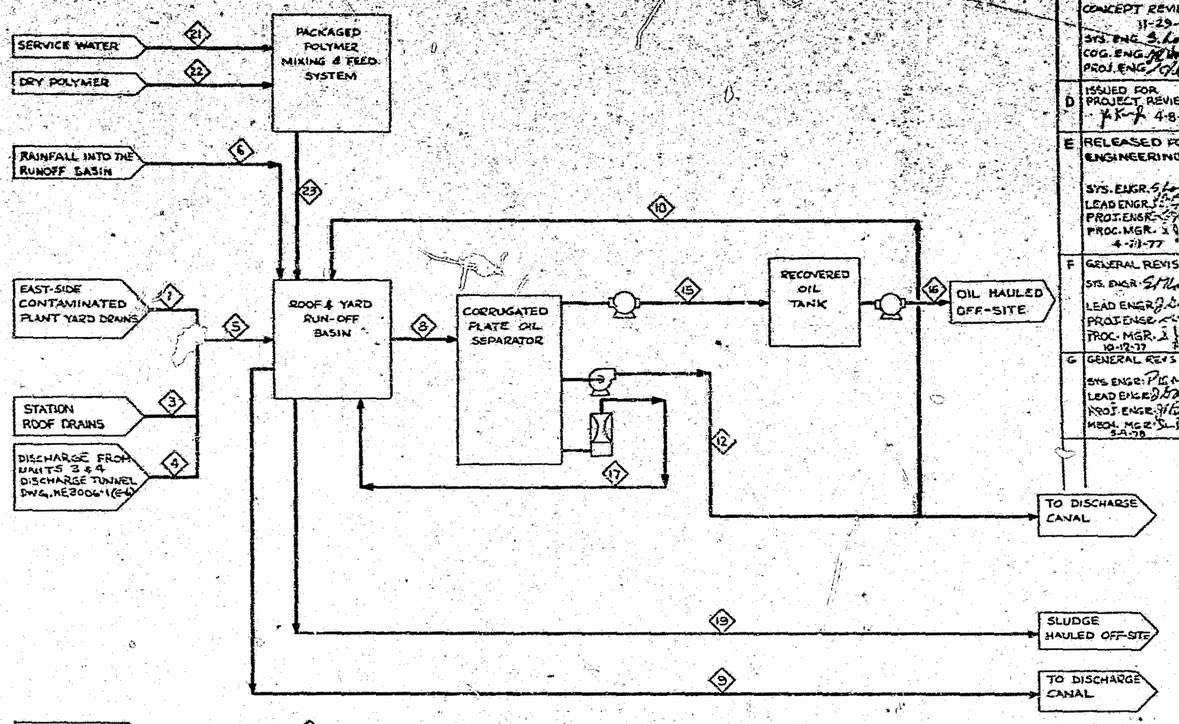
MICROFILM

Electronic Filing: Received, Clerk's Office 10/31/2022

5082ME3014



ROOF & YARD RUN-OFF — WEST SIDE



ROOF & YARD RUN-OFF — EAST SIDE

ANALYSIS	UNITS	STREAM NO. 1	2	3	4	5	6	7 (10)	8	9	10	11	12	◇	14	15	◇	◇	18	19	20	21	22	23	24
FLOW AREA MAX.	GPM	6000	—	3005	4100	2440	200	—	—	—		—	—		—	—			—	—	—	—	—	—	
FLOW CONS. MAX.	GPM	3000	—	2650	3115	2135	176	40	1096	600		600	6732		—	600			12	50	10	—	—	4.4	
FLOW, NORMAL	GPM	141	93	11	150	104	9	40	555	500		500	0		—	500			12	50	10	45	—	0.22	
FLOW, MIN.	GPM	0	0	0	0	0	0	40	40	0		0	0		—	0			0	0	0	0	—	0	
TOTAL DAILY FL.	GPD	203,530	34,100	149,000	216,000	150,000	12,200	57,600	799,300	ONLY		720,000	ONLY DURING SYSTEM FAILURE		8000	720,000			20	1000	215	320	—	320	
DAILY DURATION	HR/DAY	24	24	24	24	24	24	24	24	SYSTEM FAILURE		24			CLEANOUT	24			0.15	0.3	0.5	0.5	—	24	
FREQUENCY		INTERMITTENT						INTERMITTENT				INTERMITTENT	INTERMITTENT		ONCE/YR	INT.			INT.	ONCE/YR	INTERMITTENT				
TEMPERATURE	°F	AMB	AMB	AMB	AMB	AMB		AMB	AMB	45		AMB	AMB		—	35			45	45	45	—	—	—	
PRESSURE	PS I.G.	0	0	0	0	0	0	0	0	2		0	0		—	65			40	18	40	—	—	100	
PH		8	8	8	8	8	8	8	8	8		8	8		—	—			—	—	—	7	—	7	
TSS	MG/l	1000	—	600	300	1000	1300	150	934	>15		50	50		$1x10^5$	20			50	50	$1X10^5$	—	—	2500	
TSS	LBS/DAY	1698	—	1335	1800	1250	101	48	6232	—		300	—		7062	120			—	—	190	—	10	10	
FREE OIL	MG/l	30	—	40	40	40	40	15	34	—		31	5		—	10			$8X10^5$	$8X10^5$	31	—	—	—	
EMULSIFIED OIL	MG/l	20	—	10	10	10	10	10	12	>10		10	10		—	10			—	—	10	—	—	—	
TOTAL OIL	MG/l	50	—	50	50	50	50	25	48	>10		41	15		—	15			$8X10^5$	$8X10^5$	41	—	—	—	
TOTAL OIL	LBS/DAY	85	—	67	90	62	5	12	321	—		246	—		—	90			126	—	—	—	—	—	
SP GRAVITY		1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0		1.0	1.0		1.1	1.0			0.3	0.9	1.1	1.0	—	1.2	
MATERIAL		OILY WATER	RAIN WATER	OILY WATER	OILY WATER	OILY WATER	OILY WATER	OILY WATER	OILY WATER	RECYCLE EFFLUENT		OILY WATER	OVERFLOW WATER		SLUDGE	EFFLUENT			OIL	OIL	SLUDGE	SERVICE WATER	POLYMER SOLUTION	POLYMER SOLUTION	
ANNUAL FLOW	GAL/YR	$173x10^6$	$1.14x10^6$	$.34x10^6$	$1836x10^6$	$1275x10^6$	$.103x10^6$	$21x10^6$	$21.2x10^6$	—		$2856x10^6$	—		8260	$2255x10^6$			340	873	3,700	27,300	—	11,000	
ANNUAL OIL	LBS/YR	722	—	568	766	532	43	4381	7012	—		7032	—		3	4765			2267	5827	3	—	—	—	
ANNUAL SOLIDS	LBS/YR	14,435	—	11350	15322	10,640	865	17,524	70156	—		12,100	—		68950	4765			—	—	7260	—	230	230	

ANALYSIS	UNITS	STREAM NO. 1	2	3	4	5	6	7	8	9	10	◇	12	◇	◇	15	16	17	◇	19	◇	21	22	23
FLOW AREA MAX.	GPM	3764		8374	—	—	—		—	—	—		—			—	—	—		—		—	—	—
FLOW CONS. MAX.	GPM	3764		5090	2000	10854	—		900	6732	900		900			12	50	18		—		—	—	6
FLOW, NORMAL	GPM	218		296	1000	1208	220		800	0	800		820			12	50	12		—		15	—	45
FLOW, MIN.	GPM	0		0	0	0	0		0	0	0		0			0	0	0		—		—	—	0
TOTAL DAILY FLOW	GPD	314,100		424,800	978,792	1,734,533	316,800		1,152,000	ONLY DURING SYSTEM FAILURE			1,152,000			32	5000	340		—		1738	—	695
DAILY DURATION	HR/DAY	24		24	24	16.6	24		24		24		24			—	1.6	—		CLEANOUT		1	24	24
FREQUENCY		INTERMITTENT		INTERMITTENT					INTERMITTENT							INTERMITTENT	INTERMITTENT	INTERMITTENT		ONCE/YR		INTERMITTENT	INTERMITTENT	INTERMITTENT
TEMPERATURE	°F	AMB		AMB	AMB	AMB	AMB		45	AMB	AMB		45			45	45	45		—		AMB	—	AMB
PRESSURE	PS I.G.	0		0	0	0	0		0	0	2		6			40	18	40		—		—	—	100
PH		8		8	8	8	8		8	8	8		8			8	8	8		7		7	—	7
TSS	MG/l	1000		1000	100	883	—		50	50	>15		20			50	50	$1x10^5$		—		—	—	2500
TSS	LBS/DAY	2621		3555	833	7009	—		980	—	—		192			—	—	288		10,860		—	14.5	14.5
FREE OIL	MG/l	40		40	40	40	—		32	5	—		10			$8x10^5$	$8x10^5$	32		—		—	—	—
EMULSIFIED OIL	MG/l	10		10	10	10	—		10	10	>10		10			—	—	10		—		—	—	—
TOTAL OIL	MG/l	50		50	50	50	—		42	15	>10		15			$8x10^5$	$8x10^5$	42		—		—	—	—
TOTAL OIL	LBS/DAY	131		177	417	725	—		403	—	—		144			211	6720	—		—		—	—	—
SP GRAVITY		1.0		1.0	1.0	1.0	1.0		1.0	1.0	—		1.0			0.9	0.3	1.1		2.0		1.0	—	1.2
MATERIAL		YARD RUNOFF		ROOF RUNOFF	FLOOR DRAINS	BASIN WATER	RAIN WATER		BOILER BLOWDOWN	OVERFLOW RECYCLE			BOILER EFFLUENT			OIL	OIL	SLUDGE		SLUDGE		SERVICE WATER	POLYMER SOLUTION	POLYMER SOLUTION
ANNUAL FLOW	GAL/YR	$2.7x10^6$		$3.6x10^6$	$.256x10^6$	$.217.3x10^6$	$2.7x10^6$		$.210x10^6$	—	—		$.211x10^6$			4615	17628	628900		25842		210,000	—	84,000
ANNUAL OIL	LBS/YR	1114		1511	83450	83918	—		84059	—	—		58226			31213	50,938	22		88		—	—	—
ANNUAL SOLIDS	LBS/YR	2228		30,220	166,700	2.19400	—		87622	—	—		35216			—	—	52906		2.10640		—	1752	1752

NOTES:

① FLOW RATES ARE ESTIMATED.

② THIS IS THE CONTRIBUTION OF EACH AREA TO THE COMBINED MAXIMUM FLOW TAKING INTO ACCOUNT THE HYSTERESIS EFFECT.

NOTES:

① THIS IS THE CONTRIBUTION OF EACH AREA TO THE COMBINED MAXIMUM FLOW TAKING INTO ACCOUNT THE HYSTERESIS EFFECT.

PARTS LIST

ITEM NO.	DESCRIPTION	QUAN.	IDENTIFICATION MATERIAL	IDENTIFICATION PART NO. OR SPECIFICATION

REVISIONS		
REV.	DESCRIPTION	
A	ISSUED FOR INITIAL REVIEW	KJKC 10-27-76
B	ISSUED FOR PROJECT REVIEW	
C	ISSUED FOR CLIENT CONCEPT REVIEW 11-29-76 SYS. ENG.	
D	ISSUED FOR PROJECT REVIEW	4-8-77
E	RELEASED FOR ENGINEERING SYS. ENGR. LEAD ENGR. PROJ. ENGR. PROC. MGR.	4-21-77
F	GENERAL REVISIONS SYS. ENGR. LEAD ENGR. PROJ. ENGR. PROC. MGR.	10-12-77
G	GENERAL REVS SYS ENGR: LEAD ENGR: PROJ. ENGR: MECH. MGR:	3-9-78

RELEASED FOR ENGINEERING

COMMONWEALTH EDISON COMPANY
WASTE WATER TREATMENT FACILITIES-WAUKEGAN
* COAL PILE, ROOF & YARD RUNOFF
PROCESS FLOW DIAGRAM

DRAWING	
CHECKED	
CSE ENGINEER	
OWNER MGR. APPVL.	
APPROVAL	
APPROVAL	
APPROVAL PROJ.	
APPROVAL SAFETY	

A/E CONTRACT 802670 | ECCO DWG. NO. | REV.
NUS CORPORATION, ROCKVILLE, MD | DRAWING NO. 5082ME3014 | REV. G
SCALE NONE | SHEET 2 OF 2

183-24 31

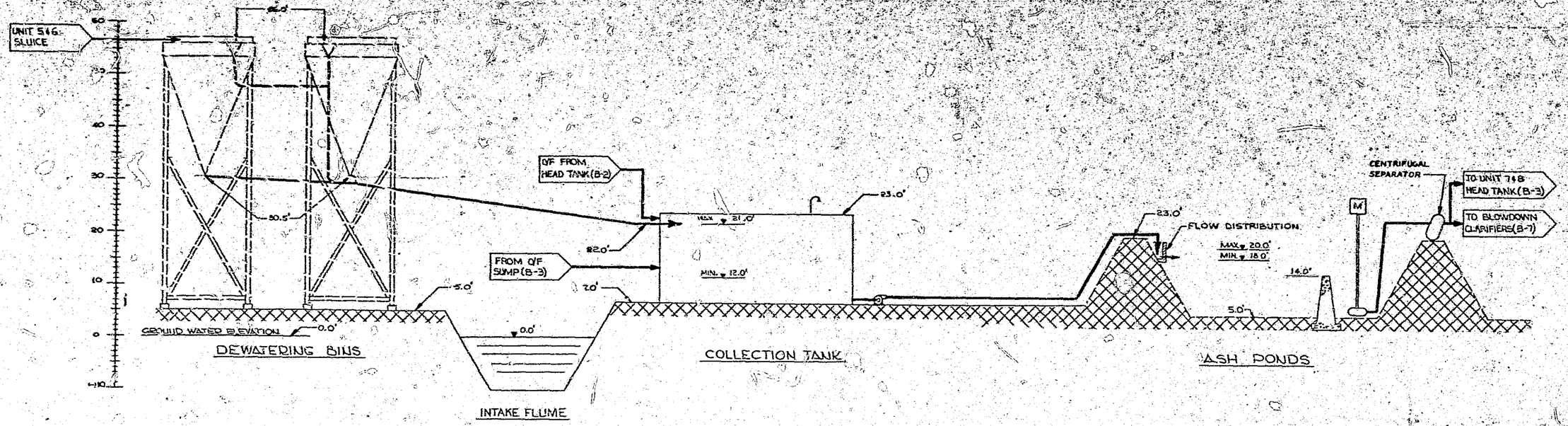
07580000113

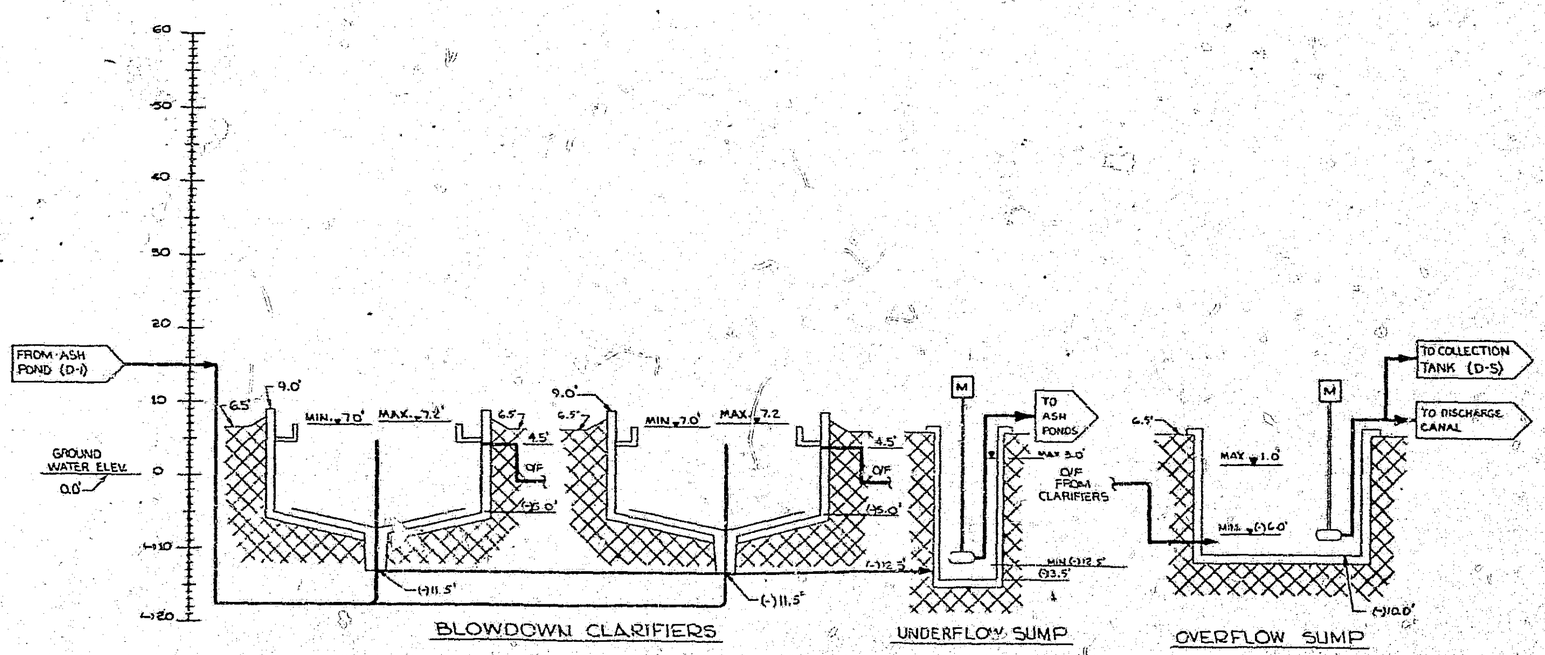
MICROFILM

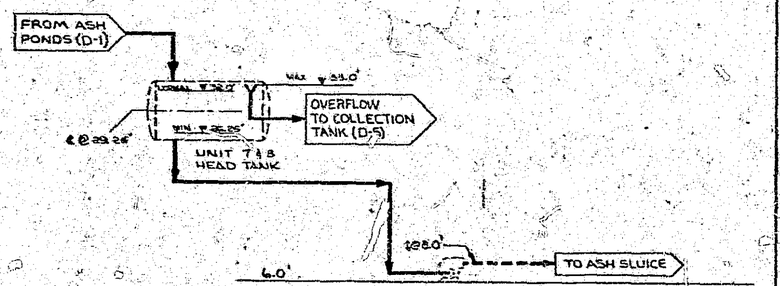
Electronic Filing: Received, Clerk's Office 10/31/2022

5082ME3015

REV	DESCRIPTION
A	ISSUED FOR INITIAL REVIEW
B	FOR SECONDARY REVIEW CHECKER W.Hunter 2-24-76
C	ISSUED FOR CLIENT CONCEPT REVIEW, DATE 10-1-76 SYSTEM ENGR. CIVIL ENGR. PE.
D	REVISED MISC. ELEVATIONS 2-14-77 SYS ENGR. CIVIL ENGR. PROJ. ENGR.
E	ISSUED FOR PROJECT REVIEW 3-30-77
F	RELEASED FOR ENGINEERING 4-14-77 SYS ENGR. LEAD ENGR. PROJ. ENGR. PROC. MGR. CIVIL MGR.
G	GENERAL REVS SYS. ENGR. LEAD ENGR. PROJ. ENGR. MECH. MGR. CIVIL ENGR. 1-17-78







RELEASED FOR ENGINEERING

DRAWN	T. MESZAROS	7/11	COMMONWEALTH EDISON COMPANY
CHECKED		11/	WASTEWATER TREATMENT FACILITIES-WAUKEGAN
ENG. APPROVAL			BOTTOM ASH SLUICE SYSTEM
QUAL. ASS. APPR.			HYDRAULIC PROFILE
APPROVAL			DATE CONTRACT 602670
APPROVAL PROJ.			CHRG. NO.
APPROVAL CLIENT			DRAWING NO. 5082ME3015
			NUS CORPORATION ROCKVILLE, MD
			SCALE 1/8"=1'-0" SHEET OF

8325 32

07580000114
MICROFILM

Electronic Filing: Received, Clerk's Office 10/31/2022

5082ME3016 REV. F

REVISIONS	
REV.	DESCRIPTION
A	ISSUED FOR INITIAL REVIEW 2-18-77
B	ISSUED FOR PROJECT REVIEW 3-16-77
C	RELEASED FOR ENGINEERING 4-7-77
D	LAYOUT REDRAW. SYS. ENGR. LEAD ENGR. PROJ. ENGR. PROC. MGR. CIVIL ENGR. 10-24-77
E	GENERAL REV'S SYS. ENGR. LEAD ENGR. PROJ. ENGR. MECH MGR. CIVIL ENGR. 1-27-78
F	GENERAL REV'S SYS. ENGR. LEAD ENGR. PROJ. ENGR. CIVIL ENGR.

PROPOSED DEMINERALIZER REGENERANT WASTE TANK

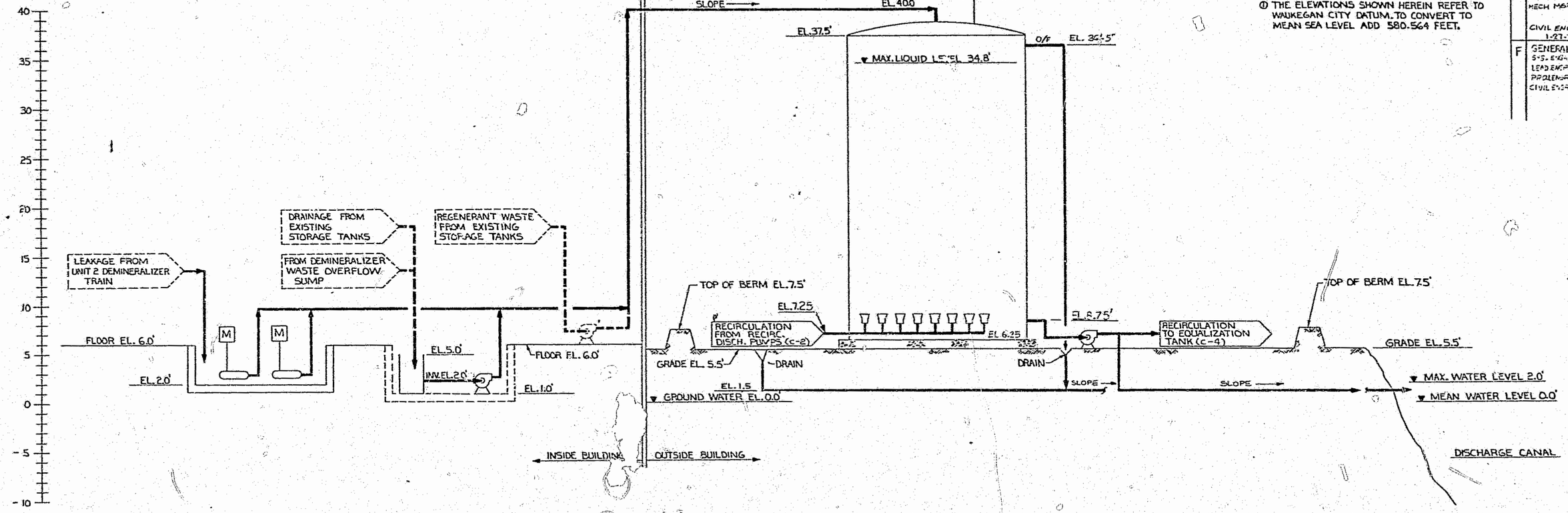
2 DEMINERALIZER REGENERANT WASTE DRAIN PUMPS

CONTAINMENT BERM

PROPOSED EQUALIZATION TANK

CONTAINMENT BERM

NOTES:
① THE ELEVATIONS SHOWN HEREIN REFER TO WAUKEGAN CITY DATUM. TO CONVERT TO MEAN SEA LEVEL ADD 580.564 FEET.



EQUALIZATION SCALE

NEW DEMINERALIZER SUMP & PUMPS

EXISTING CONDENSATE PUMP PIT

2 EXISTING DISCHARGE PUMPS

2 NEW RECIRCULATION DISCHARGE PUMPS

DRAWING STATUS: RELEASED FOR ENGINEERING

DRAWN	G Van Sick	4/4/77
CHECKED		4/5/77
LOC. ENGINEER		
DISCIP. MGR. (APPL.)		
APPROVAL		
APPROVAL		
APPROVAL PROJ.		
APPROVAL CLIENT		

COMMONWEALTH EDISON COMPANY
WASTE WATER TREATMENT FACILITIES-WAUKEGAN
DEMINERALIZER WASTE EQUALIZATION SYSTEM
HYDRAULIC PROFILE

CECO CONTRACT 802670	CECO DWG. NO.
NUS CORPORATION ROCKVILLE MD	DRAWING NO. 5082ME3016 REV.
	SCALE NONE SHEET 1 OF 1

1 3 3633

07580000115
MICROFILM

Electronic Filing: Received, Clerk's Office 10/31/2022

REV.	DESCRIPTION
A	ISSUED FOR INITIAL REVIEW 11-30-76
B	ISSUED FOR PROJECT REVIEW 12-14-76
C	ISSUED FOR CLIENT REVIEW 12-21-76
D	LAYOUT REDRAWN ISSUED FOR PROJECT REVIEW 4-14-77
E	RELEASED FOR ENGINEERING 4-28-77
F	LAYOUT REDRAWN GENERAL REVISIONS SYS. ENGR. LEAD ENGR. PROJ. ENGR. MECH. MGR. CIVIL ENGR. 1-27-78

MAIN WASTEWATER BUILDING

FROM METAL CLEANING WASTE COLLECTION SYS.

44'-3" MAX. LEVEL

O/F 45'-3"

▽ 18'-0" MIN. LEVEL

GRADE EL. 7'-6"

8'-3"

4'-6"

AVG GROUND WATER EL. 0'-0"

TO COLLECTION DRAIN SUMP (D-3)

TO FLASH MIX TANK (D-2)

17'-6"

FL EL 7'-0"

GRADE EL. 6'-6"

CAUSTIC TO FLASH MIX TK. (D-2)

POLYMER FEEDER SYSTEM

WASTE WATER FROM CONTINUOUS ROTARY VACUUM FILTER (B-3)

BOTTOM OF TRENCH EL. 6'-0"

DRAIN FROM WASTE WATER EQUALIZATION TANK (D-6)

TO EACH BLOW DOWN CLARIFIER (B-6)

FILTRATE FROM SLUDGE FILTER (B-3)

SLUDGE FROM U/F SUMP (B-3)

CAUSTIC FROM CAUSTIC TANK (D-4)

FROM WASTE WATER EQUALIZATION TK. (D-6)

M

WEIR LEVEL

12'-0"

11'-6"

7'-0"

10'-6"

GR. EL. 6'-6"

6'-0"

5'-0"

2'-0"

2'-5"

5'-0"

▽ (-)3'-0" MIN. LEVEL

(-)12'-6"

(-)17'-5" To BLOWDOWN CLARIFIER

MATCHLINE - CONTINUED BELOW

WASTE WATER EQUALIZATION TANK

CAUSTIC TANK

FLASH MIX TANK

ELEVATION SCALE

MAIN WASTEWATER BUILDING

MATCHLINE - CONTINUED FROM ABOVE

FROM POLYMER FEED SYSTEM (D-2)

0'-0"

8'-6"

GR EL. 6'-6"

7'-0"

0'-6"

AVG GROUND WATER EL. 0'-0"

(-)5'-0"

(-)13'-0"

(-)11'-6"

(-)11'-5"

TO G/FLOW SUMP (B-6)

FILTRATE TO FLASH MIX TANK (E-2)

TO VACUUM PUMP

BUILDING WALL

FROM ACID FEED SYSTEM DWG. ME3015-E

SLUICE GATE

MAX. LEVEL

MIN. LEVEL

1'-0"

(-)15'-0"

(-)17'-5"

MIN OPER. LEVEL (-)17'-6"

-12'-6"

(-)11'-6"

SOLIDS FOR TRUCKING

WASH WATER TO COLLECTION DRAIN SUMP (D-5)

FROM BLOWDOWN CLARIFIER (B-5)

2 BLOWDOWN CLARIFIERS

CLARIFIER UNDERFLOW SUMP

2 CONTINUOUS ROTARY VACUUM FILTERS

CLARIFIER OVERFLOW SUMP

BOTTOM ASH SLUICE SYSTEM OVERFLOW SUMP

NOTES:

① CAUSTIC PIPING INSIDE MAIN WASTEWATER TREATMENT BUILDING IS HEAT TRACED AND PLACED IN CONCRETE TRENCH

② POLYMER PIPING SUPPORTED UNDER CLARIFIER BRIDGE.

BIDDING STATUS

RELEASED FOR ENGINEERING

DRAWN	C.M.H.	1/31/77
CHECKED		
COG. ENGINEER		
DISCIP. MGR. APPVL.		
APPROVAL		
APPROVAL		
APPROVAL FROM		
APPROVAL AGENCY		

COMMONWEALTH EDISON COMPANY
WASTEWATER TREATMENT FACILITIES-WAUKEGAN
METAL CLEANING WASTE SYSTEM
HYDRAULIC PROFILE

CECO CONTRACT 352470 | SERV. SYS. NO. | REV.

RUST ENGINEERING CORPORATION HOUSTON, TEXAS | DRAWING NO. 5082ME3017 | REV. F

SCALE 1/2"=1'-0" | SHEET NO. 1

83-3734

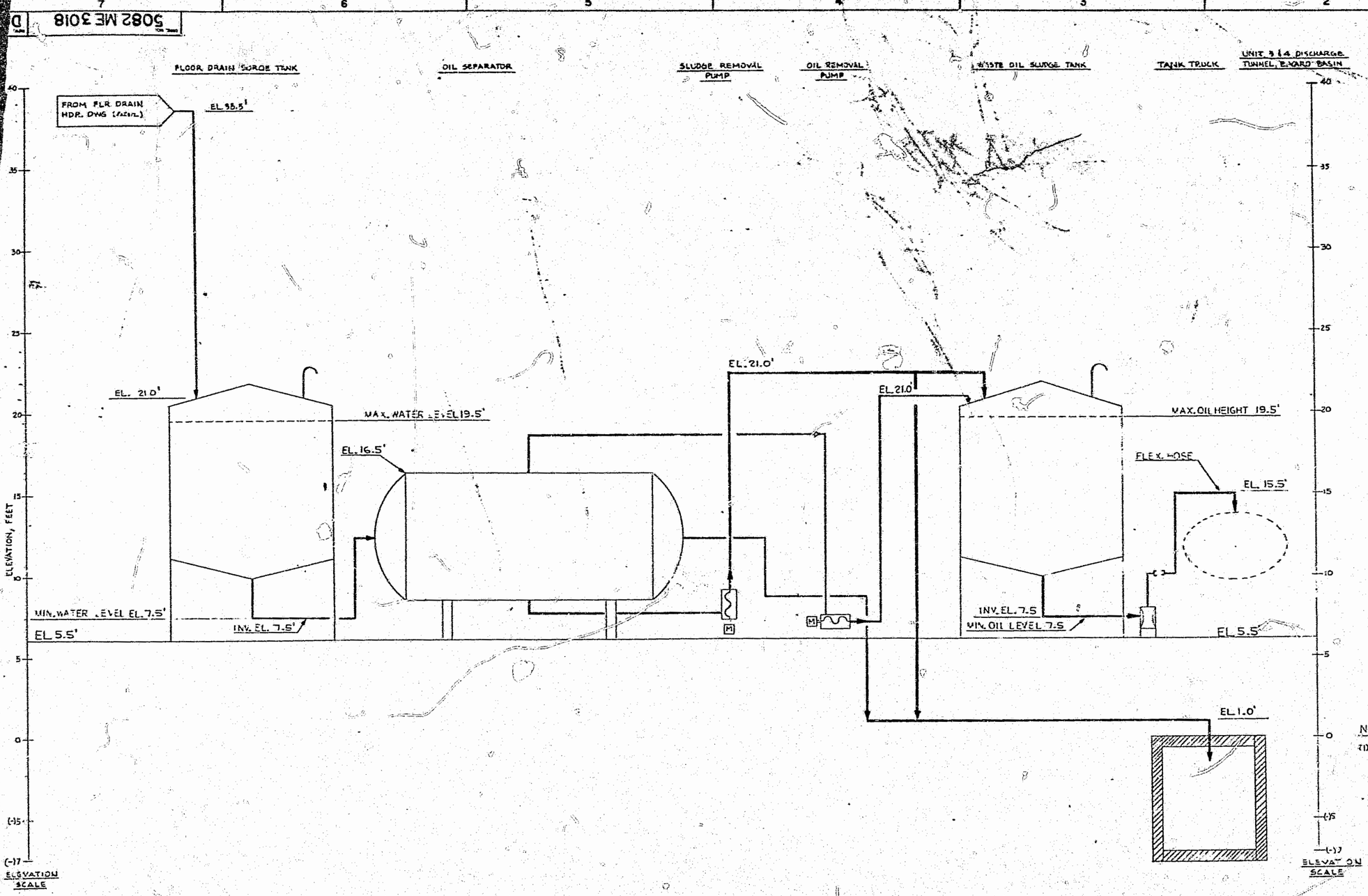
07580000116
MICROFILM

Electronic Filing: Received, Clerk's Office 10/31/2022

Electronic Filing: Received, Clerk's Office 10/31/2022

5082 ME 3018

REVISIONS	
REV.	DESCRIPTION
A	ISSUED FOR PROJECT REVIEW 4-6-77
B	RELEASED FOR ENGINEERING 4-18-77
C	GENERAL REVS 10-7-77
D	LAYOUT REDRAWN GENERAL REVS SYS. ENGR. LEAD ENGR. PROJ ENGR. CIVIL ENGR. MECH. NGR. 4-7-78



NOTES:

1) THE ELEVATIONS SHOWN REFER TO WAUKEGAN CITY DATUM. TO CONVERT TO MEAN SEA LEVEL ADD 580.564 FEET

RELEASED FOR ENGINEERING

COMMONWEALTH EDISON COMPANY
WASTE WATER TREATMENT FACILITIES WAUKEGAN
BUILDING PLUMBING & FLOOR DRAINS
HYDRAULIC PROFILE

NUS CORPORATION, ROCKVILLE, MD

DRAWING NO. 5082 ME 3018 REV. D

1 83-39 35

07580000117

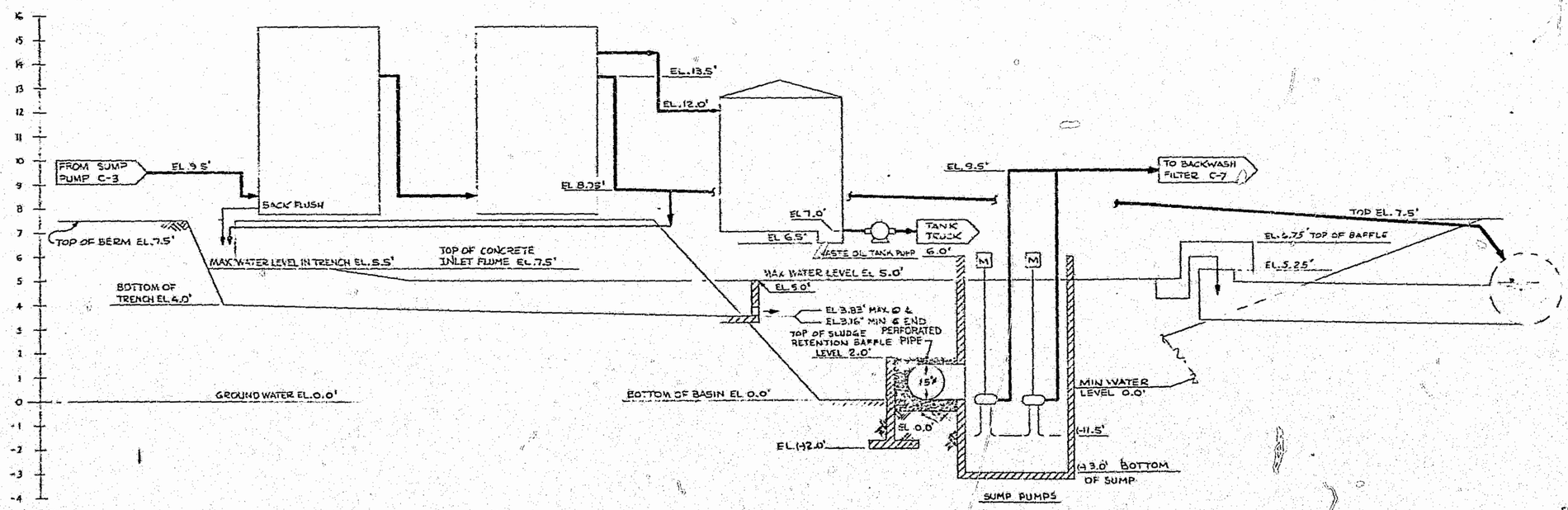
MICROFILM

Electronic Filing: Received, Clerk's Office 10/31/2022

5082ME3020 H

PARTS LIST					
REF	ITEM	DESCRIPTION	REQ'D	IDENTIFICATION	
				MATERIAL	PART NO. OR SPECIFICATION

REVISIONS	
REV	DESCRIPTION
A	ISSUED FOR INITIAL REVIEW 12-9-76
B	ISSUED FOR PROJECT REVIEW 12-21-76
C	ISSUED FOR CLIENT CONCEPT REVIEW 1-5-76
D	REVISED DATUM ADDED ASH POND CONN. TO CPP BASIN
E	ISSUED FOR PROJECT REVIEW 3-30-77
F	RELEASED FOR ENGINEERING 4-7-77 SYS. ENGR. LEAD ENGR. PROJ. ENGR. PROC. MGR. CIVIL MGR.
G	GENERAL REVISIONS SYS. ENGR. LEAD ENGR. PROJ. ENGR. PROC. MGR. CIVIL ENGR. 10-12-77
H	GEN REVS SYS. ENGR. LEAD ENGR. PROT. ENGR. MECH. MGR. CIVIL ENGR. 4-7-78



NOTES:
1. LOCATE OVERFLOW NEAR INLET
2. THE ELEVATION SHOWN HEREON REFERS TO WAUKEGAN CITY DATUM. TO CONVERT TO MEAN SEA LEVEL, ADD 580.564 FT.

RELEASED FOR ENGINEERING

COMMONWEALTH EDISON COMPANY
WASTE WATER TREATMENT FACILITIES - WAUKEGAN
COAL PILE ROOF & YARD RUN-OFF
HYDRAULIC PROFILE

DRAWING NO. 5082ME3020 REV H

83-38 36

07580000118
MICROFILM

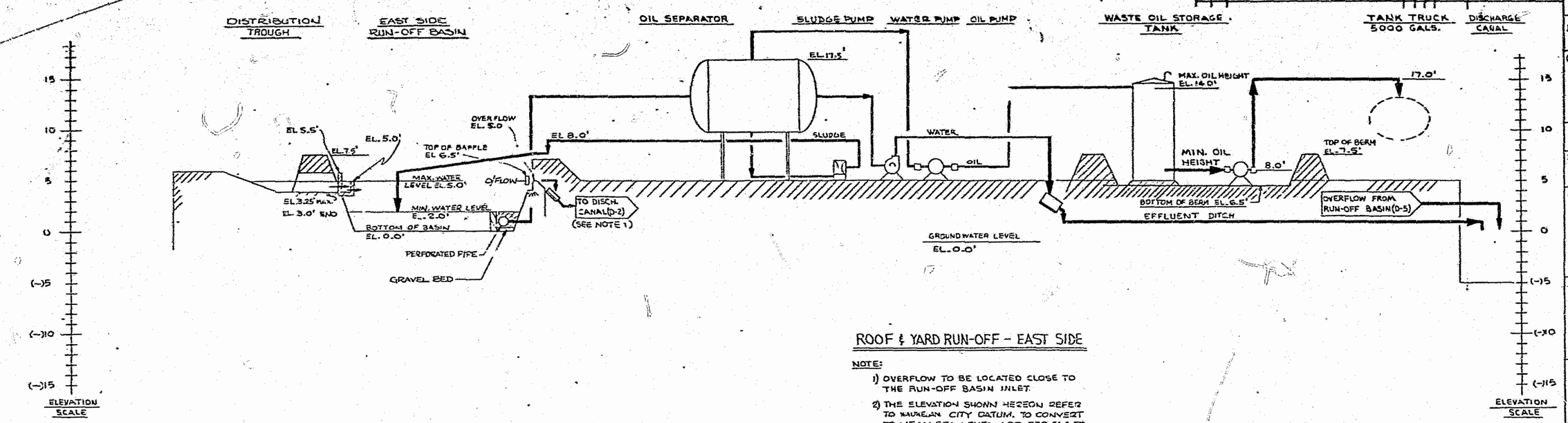
Electronic Filing: Received, Clerk's Office 10/31/2022

5082ME3020

REVISIONS	
REV.	DESCRIPTION
A	ISSUED FOR INITIAL REVIEW
B	ISSUED FOR PROJECT REVIEW T.R.K. 12-21-76
C	ISSUED FOR CLIENT CONCEPT REVIEW 4/8/77 SYS. ENGR. CML SYS. ENGR. COG. ENGR. PROJ. ENGR.
D	REVISED DATUM. T.R.K. 1-13-77
E	ISSUED FOR PROJECT REVIEW T.R.K. 4-8-77
F	RELEASED FOR ENGINEERING 4-21-77 SYS. ENGR. LEAD ENGR. PROJ ENGR. PROC MGR. CIVIL MGR.
G	GENERAL REVISIONS SYS. ENGR. LEAD ENGR. PROJ. ENGR. PROC. MGR. CIVIL MGR. 10-12-77
H	GENERAL REVS SYS. ENGR. LEAD ENGR. PROJ. ENGR. MECH MGR CIVIL ENGR. 4-7-78

PARTS LIST

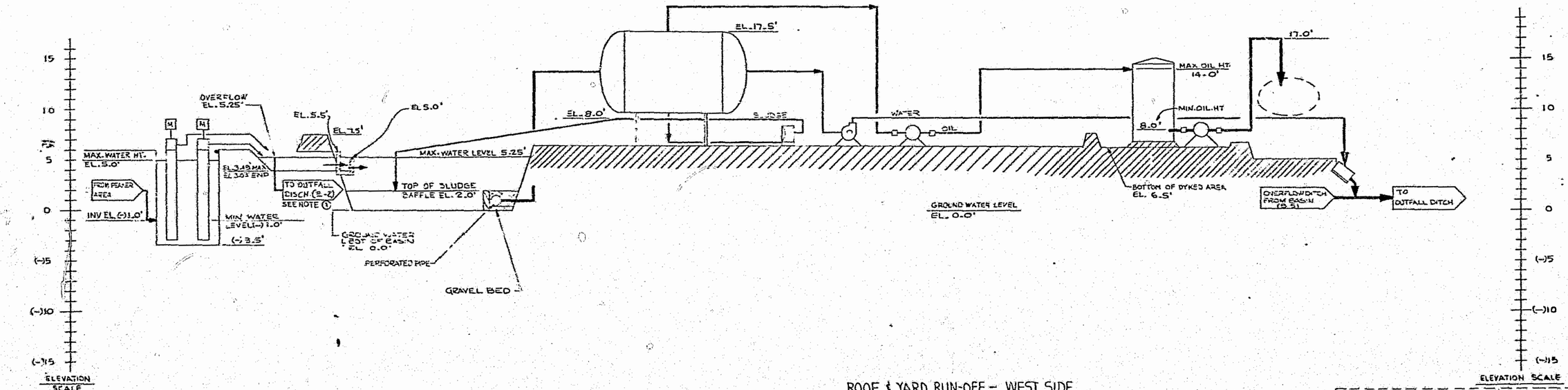
REF ITEM	DESCRIPTION	REQ'D	IDENTIFICATION MATERIAL	IDENTIFICATION PART NO. OR SPECIFICATION



ROOF & YARD RUN-OFF – EAST SIDE

NOTE:

1) OVERFLOW TO BE LOCATED CLOSE TO THE RUN-OFF BASIN INLET.
2) THE ELEVATION SHOWN HEREON REFER TO WAUKEGAN CITY DATUM. TO CONVERT TO MEAN SEA LEVEL ADD 590.564 FT.



ROOF & YARD RUN-OFF – WEST SIDE

NOTE:

1) OVERFLOW TO BE LOCATED JUST BEFORE THE RUN-OFF BASIN INLET.
2) THE ELEVATIONS SHOWN HEREON REFER TO WAUKEGAN CITY DATUM. TO CONVERT TO MEAN SEA LEVEL ADD 580.564 FT.

DRAWING STATUS: RELEASED FOR ENGINEERING

DRAWN	
CHECKED	
COG. ENGINEER	
CHEM. MGR. APPVL.	
APPROVAL	
APPROVAL	
APPROVAL PROJ.	
APPROVAL CLIENT	

COMMONWEALTH EDISON COMPANY
WASTE WATER TREATMENT FACILITIES-WAUKEGAN
COAL PILE, ROOF & YARD RUN-OFF SYS.
HYDRAULIC PROFILE

NUS CORPORATION, ROCKVILLE MD
DRAWING NO. 5082ME3020

12/4/37

07580000119
MICROFILM

Electronic Filing: Received, Clerk's Office 10/31/2022

5082ME3022

BLR 17-UNIT 6 SLAG TANK OVERFLOWS

UNIT 6 ECON. F.A. & HOPPERS

UNIT 6 ASH SLUICE PUMPS

U6 HYDROVEYOR

ATMOSPHERIC VENT TO ROOF

UNIT 6 AIR SEPARATOR TANK

OVERFLOW

UNIT 7 ECON. F.A. & HOPPERS

UNIT 7 ASH SLUICE PUMPS

U7 HYDROVEYOR

ATMOSPHERIC VENT TO ROOF

UNIT 7 AIR SEPARATOR TANK

OVERFLOW

UNIT 8 ECON. F.A. & HOPPERS

UNIT 8 ASH SLUICE PUMPS

U8 HYDROVEYOR

VERT. ATMOS. VENT

UNIT 8 AIR SEPARATOR TANK

FLUSH CONN.

ASH SLUICE PUMP SUCTION HEADER

BAFFLE

NEW ECONOMIZER FLY ASH SLUICE TANK

8' DIA. X 8' HIGH TANK ≈ 3000 GAL. CAP. ON TOP OF FLOOR W/3 HOR. CENT. PUMPS @ 1200 GPM EACH & CONT. MIXER.

TO ASH PONDS

PARTS LIST

REF ITEM	DESCRIPTION	REQ'D	IDENTIFICATION MATERIAL	IDENTIFICATION PART NO. OR SPECIFICATION

REV	DESCRIPTION
A	ISSUED FOR INITIAL REVIEW G Bogdan 11/29/76
B	ISSUED FOR PROJECT REVIEW 12-30-76
C	ISSUED FOR CLIENT CONCEPT REVIEW 1-7-77 SYS. ENGR. JJ Jacobs ICC ENGR. COG. ENGR. PROJ. ENGR.
D	ISSUED FOR PROJECT REVIEW G Bogdan 3-28-77
E	RELEASED FOR ENGINEERING 5-4-77 SYS ENGR JJ Jacobs LEAD ENGR PROJ ENGR MECH MGR

ANALYSIS	UNITS	STREAM NUMBER ①	②	③	④	⑤	⑥	⑦	⑧	⑨	⑩	⑪	⑫	⑬	⑭	⑮	⑯	⑰	⑱	⑲	⑳	㉑	㉒
ASH FLOW	TONS/DAY	2.63					25.1					28.0								—	—	—	55.53
DESIGN FLOW	GPM	—	1100	1100	1100	INTER-MITTENT	—	1030	1080	1080	INTER-MITTENT	—	1080	1105	1105	1100	1080	1105	480	300	250	1200	3235
AVERAGE FLOW	GPD	—	1584,000	1584,000	1584,000	—	—	123,600	129,600	129,600	—	—	291,600	298,350	298,350	1584,000	129,600	298,350	691,200	81,000	67,500	INTER-MITTENT	2722,650
FLOW MAX.	GPM	—	1100	1100	1100	—	—	1030	1080	1080	—	—	1080	1105	1105	1100	1080	1105	480	300	250	1200	3235
TEMPERATURE	°F	AMBIENT	AMB.	AMB.	AMB.	AMB.	AMB.	AMB.	AMB.	AMB.	AMB.	AMB.	AMB.	AMB.	AMB.	AMB.	AMB.	AMB.	150	AMB.	AMB.	AMB.	AMB.
PRESSURE	PSIG	VACUUM	350	<380	GRAVITY	GRAVITY	VACUUM	340	<340	GRAVITY	GRAVITY	VACUUM	325	<375	GRAVITY	GRAVITY	GRAVITY	GRAVITY	GRAVITY	265	265	GRAV.	50
FREQUENCY	PER DAY	CONT.	CONT.	CONT.	CONT.	AS REQ'D	ONCE	ONCE	ONCE	ONCE	AS REQ'D	ONCE	ONCE	3 TIMES	ONCE	CONT.	ONCE	ONCE	CONT.	3 TIMES	3 TIMES	AS REQ'D	AS REQ'D
DURATION	MIN	CONT.	CONT.	CONT.	CONT.	AS REQ'D	120	120	120	120	AS REQ'D	270	270	270	270	CONT.	120	270	CONT.	270	270	AS REQ'D	AS REQ'D
PH		—	6.0-8.0	9.0-11.0	9.0-11.0	9.0-11.0	—	6.0-8.0	9.0-11.0	9.0-11.0	9.0-11.0	—	6.0-8.0	9.0-11.0	9.0-11.0	9.0-11.0	9.0-11.0	9.0-11.0	8.0	6.0-8.0	6.0-8.0	6.0-8.0	9.0-11.0
TSS	% x WT.	100	200 PPM	<1%	<1%	<1%	100	200 PPM	4.6	4.8	4.8	100	200 PPM	2.3	2.3	<1	4.8	2.3	LATER	200 PPM	200 PPM	200 PPM	<1%
OIL & GREASE	MG/L	DRY	0	LATER	LATER	LATER	DRY	0	LATER	LATER	LATER	DRY	0	LATER	LATER	LATER	LATER	LATER	0	0	0	0	0
IRON	MG/L		0.39					0.39					0.39						0.47	0.39	0.39	0.39	0.19
COPPER	MG/L		0.47					0.47					0.47						0.38	0.47	0.47	0.47	0.54
ZINC	MG/L		0.24					0.24					0.24						0.14	0.24	0.24	0.24	0.84
CHROMIUM	MG/L		0.16					0.16					0.16						0.16	0.16	0.16	0.16	0.37
PHOSPHOROUS	MG/L		0.61					0.61					0.61						0.63	0.61	0.61	0.61	0.14
TDS	MG/L		1395					1395					1395						1379	1395	1395	1395	1539

NOTES:

① VALUES OF LINES ⑦ ⑧ ⑨ & ⑩ WERE USED FOR TOTAL FLOW GIVEN ON LINE ③.

② SPACES MARKED LATER IN CHART WILL BE SAMPLED & ANALIZED; TRUE VALUES WILL THEN BE FILLED IN.

RELEASED FOR ENGINEERING

COMMONWEALTH EDISON COMPANY
WASTE WATER TREATMENT FACILITIES - WAUKEGAN
ECON. FLY ASH SLUICE SYSTEM
PROCESS FLOW DIAGRAM

DRAWING NO. 5082ME3022 REV. E

NUS CORPORATION ROCKVILLE, MD. SCALE NONE SHEET OF

83-4039

07580000120

MICROFILM

Electronic Filing: Received, Clerk's Office 10/31/2022

5082ME3024 2

EQUIPMENT AND INSTRUMENTATION DESIGNATION KEY

ITEM NO.		METAL CLEANING WASTE	LEGAL PILE RUNOFF	WEST ROOF AND YARD RUNOFF	EAST ROOF AND YARD RUNOFF	BOTTOM ASH SYSTEM
1	NUS. EQ. NO.	12MW101-S	12CR-1025	12PW-1025	12PW-1025	12BA-1025
2	ACCESSION MODEL NO.	530-53-220	530-53-224	530-53-220	530-53-220	530-53-220
1	SERVICE WATER	PS-510	PS-516	PS-522	PE-23	PS-535
2		PI-511	PI-517	PI-523	PI-529	PI-535
3		ASV-512	ASV-518	ASV-524	ASV-530	ASV-536
4	MIXING TANK	LS-513	LS-519	LS-525	LS-531	LS-537
5	AGING TANK	LS-514	LS-520	LS-526	LS-532	LS-538
6	PULSATION DAMPENER	PI-520	PI-521	PI-527	PI-533	PI-539
7	POWER OFF/ON	HS-490	HS-519	HS-350	HS-540	HS-680
8	MIXER ON/OFF	-491	-311	-331	-341	-681
9	WATER INLET VALVE OPEN/CLOSED	-492	-312	-332	-342	-682
10	AIR DRYER ON/OFF/TIMED	-493	-313	-333	-343	-683
11	SCRUBBER BLOWER ON/OFF	-494	-314	-334	-344	-684
12	AIR BLOWER ON/OFF	-495	-315	-335	-345	-685
13	MIXING TANK LEVEL HIGH/LOW	-496	-316	-336	-346	-686
14	AGING TANK LEVEL HIGH/LOW	-497	-317	-337	-347	-687
15	FEED PUMP A ON/OFF	-498	-318	-338	-348	-688
16	FEED PUMP B ON/OFF	—	—	—	—	—
	POWER ON	—	—	—	—	—
16	AIR DRYER SIGNAL	AA 918	AA 899	AA 920	AA 938	AA-932
17	LOW HOPPER LEVEL	LAL 915	LAL 895	LAL 918	LAL-936	LAL-940
18	TANK 1 IN USE	XL 970	XL 892	XL 913	XL-951	XL-955
19	TANK 1 DRYING	XL 971	XL 893	XL 914	XL 952	XL-956
20	TANK 2 IN USE	XL 972	XL 894	XL 915	XL 953	XL-957
21	TANK 2 DRYING	XL 973	XL 895	XL 916	XL-954	XL 958
22	AIR DRYER TANK	AA 917	AA 920	AA 921	AA 957	AA 943
23	LOW AGE TK. LEVEL	LAL 916	LAL 897	LAL 919	LAL 957	LAL 961
24	LOW WATER PRESS	PAL 914	PAL 894	PAL 917	PAL-955	PAL-959
25	P&ID REF DWG.	ME3005-4	ME3005 1	ME 3005-2	ME 3005-2	ME3005 5
	ZONE	(D-5)	(E-6)	(B-1)	(D-1)	(D-2)
26						
27						
28	FEED PUMP DISCH. PRESS	MCP-260	CRP-1-260	RVP 1-260	RVP-1-260	BAP-1-260
27	FEED PUMP DISCH. HEADER	MCP-260/97	CRP-1/2-260	RVP 1/2-260	RVP 1/2-260	BAP 1/2-260
30	FEED PUMP SUCTION	MCP-260	CRP-1/2-260	RVP 1/2-260	RVP 1/2-260	BAP 1/2-260
31	AGING TANK DRAIN	MCP-1-260	CRP-3-260	RVP-3-260	RVP-3-260	BAP-3-260
32	AGING TANK O/F	MCP-2-260	CRP-2-260	RVP 2-260	RVP-2-260	BAP-2-260
33	MIXING TANK O/F	MCP-13-260	CRP-13-260	RVP 13-260	RVP 13-260	BAP-13-260
34	POLYMER FEED	MCP-13 260	CRP-13 260	RVP 13-260	RVP 13-260	BAP-13-260
35	WATER INLET TO MIXING TK	PSW-1102-262	PSW-1-201-262	PSW-1-201-262	PSW 1 201-262	PSW-1 102-262
36	WATER INLET TANK WATER	PSW-1102-262	PSW-1-201-262	PSW-1-201-262	PSW-1-201-262	PSW-1102-262

REVISIONS	
NO.	DESCRIPTION
1	APPROVED FOR CONSTRUCTION 9-22-78
2	ADDED ITEM NOS. 25 THRU 36 & REV SERV WTR. ARRGT. CHECKED FOR CON. ENGR. ELECTRIC GRAPHICS CIVIL/STRUCT. MECH. NDR PE. NO 36620 PROJ. ENGR. 2-21-79

WATER INLET TO MIXING TANK DWG. ME 3025-1 — LINE NO. (36)

WATER MIXING TEE SUPPLY DWG. ME 3025-1 — LINE NO. (35)

POLYMER FEEDER H.P. 1/3 | AIR DRYER | AIR BLOWER | MIXING TANK | SCRUBBER BLOWER | AGING TANK | POLYMER FEED PUMPS | FROM MAIN PANEL

MIXER

TO FLOOR DRAINS

POLYMER FEED LINE DWG. (25)

MIXING TEE SUPPLIED BY VENDOR

ROTAMETER SUPPLIED BY VENDOR

07580000121
MICROFILM

APPROVED FOR CONSTRUCTION

COMMONWEALTH EDISON COMPANY
WASTE WATER TREATMENT FACILITIES-WAUKEGAN
POLYMER FEED SYSTEM
PIPING & INSTRUMENTATION DIAGRAM

302670 | 5082ME3024 | 2

NUS CORPORATION ROCKVILLE MD

93-49

Electronic Filing: Received, Clerk's Office 10/31/2022

5082ME3161 2

REVISIONS	
REV	DESCRIPTION
1	APPROVED FOR CONSTRUCTION 6-22-78
2	OPEN

(CONSTRUCTION)

12'-0" WIDE x 16'-0" HIGH ELEC. LIFT (ROLL-UP DOOR)

ELECTRICAL DUCT

VACUUM FILTER AUX. PACKAGE

12' WIDE x FULL HEIGHT REMOVABLE PANEL IN WALL (FOR FILTER REMOVAL)

OUTLINE OF SLUDGE EQUALIZATION TANK (ABOVE)

VACUUM FILTER AUX. PACKAGE

STONE (ABOVE)

2-4'x8' DOORS

WINDOW

UNIT HEATER (ABOVE) 16HV-100-BF

SLOPE 1/8" IN 12"

FIN FLOOR HIGH POINT EL 7'-0"

AIR DRYER

CABLE TRAYS

VAC. EXHAUST 8'-0" ABOVE FL.

THIS AREA PROVIDED FOR LIME EQUIPMENT IF REQUIRED

INSTRUMENT AIR COMPRESSORS

DRAIN

FL 4" DRAIN

UNIT HEATER (ABOVE) 16HV-100-BE

UNIT HEATER (ABOVE) 16HV-100-BD

PIPE TRENCH WITH CHECKER COVER

10' WIDE x FULL HEIGHT REMOVABLE PANEL IN WALL

8'ϕ x 12'-0" VACUUM FILTER (ENDLESS BELT TYPE) 16MC-101-FA

8'ϕ x 12'-0" VACUUM FILTER (ENDLESS BELT TYPE) 16MC-101-FB

PIPING CONTR TO LOCATE SILENCER WITH SPOOL PIECE TO SUIT (TYP.)

PLATFORM EL. 14'-6"

24" FLAT BOTTOM CONV.

4" HUB DRAIN FOR CONV. DRIP PAN DRAIN

PLATFORM EL. 13'-3

CABLE TRAY

4" DRAIN

PLATFORM @ EL. 30'-1½"±

TRENCH LIP EL. 6'-10½"

LAB SINK

REMOVABLE GRATING (TYP.)

MANHOLE WITH COVER & LADDER

16MC-113-PA

16MC-113-FB

UNIT HEATER (ABOVE) 16HV-100-EQ U/S @ EL. 20'-0"

INV. EL. 5'-8¼"

INV. EL. 5'-6"

4" ϕ PIPE ⅛" IN 12" SLOPE

H.P. TRENCH EL. 5'-4½"

SLOPE DOWN

FLOOR TRENCH 18" WIDE

LOW POINT EL. 4'-10½"

4'-0" x 4'-0" = 4'-0" DEEP SUMP LIP EL. 6'-10¾"

2 TON CAP. MONORAIL ABOVE 16MC-100-M

ROOF EXHAUST FAN ABOVE 16HV-102-EB

8'-2½" x 13'-6" DR MTL. CLG. COLL. DRAIN SUMP 16MC-104-N

ROOF EXH FAN ABOVE 16HV-104-EA

2'x2'-0" SUMP (TYP.)

¼" IN 12" SLOPE (TYP.)

CONDUITS IN SLAB

SLOPE

SLOPE SLOPE

SLOPE DOWN

FIN. FLOOR EL. 7'-7"

POLYMER FEED SYSTEMS

6" WIDE x 7" HIGH CURBS (TYP.) TO CURB EL. 7'-7"

PUMPS 16MC-112-PA 16MC-112-PB

10'-9" x 10' HIGH

CAUSTIC FEED TANK 16MC-108-T

SHEET STEEL BARRIER PARTITION 10'-0" HIGH

HIGH POINT FLOOR EL. 6'-11½"

EMERGENCY EYEWASH SHOWER AREA

(FUTURE) (FUTURE) SWITCH GEAR

MCC 5A&B

MCC 5C&D

CONTROL PANEL 24'-0" x 5'-4" x 7'-6" HIGH

FRONT

UNIT HEATER (ABOVE) 16HV-100-EB

SPACE FOR CONDUITS IN FLOOR (SEE ELECT. DWGS)

UNIT HEATER ABOVE 16HV-100-EA

FIN. FLOOR HIGH POINT EL. 7'-0"

12'-0" WIDE x 16'-0" HIGH VERT. LIFT (ROLL-UP DOOR)

COMMERCIAL PROJECTED WINDOWS (TYPICAL) SILLS @ EL. 12'-0"±

ELECTRICAL DUCT

WINDOW

ME3161-5

ME3161-4

"M"

"N"

APPROVED FOR CONSTRUCTION

P.D. ARROWSMITH 6/6/78

07580000122

MICROFILM

COMMONWEALTH EDISON COMPANY
WASTE WATER TREATMENT FACILITIES-WAUKEGAN
EQUIPMENT ARRANGEMENT
YARD S-297/W188
MAIN WASTE TREATMENT BLD'G. PLAN

CECO CONTRACT 83-3-70

CECO DWG NO:

NUS CORPORATION ROCKVILLE, MD.

DRAWING NO. 5082ME3161

SCALE 3/8"=1'-0"

SHEET 7 OF 12

Electronic Filing: Received, Clerk's Office 10/31/2022

5082ME3165 2

REVISIONS	
REV	DESCRIPTION
1	APPROVED FOR CONSTRUCTION 6-22-78
2	ADDED PIPING DESIGNER: NG CDG ENG: MECH. ENG: PROJ. ENG: CHECKED: 11/9/78

PLAN
SCALE: 3/8"=1'-0"

SECTION "T-T"

SECTION "S-S"

NOTES:
1) FOR TYPICAL DRN. & SAMPLE CONN. DETAILS SEE DWG. ME-3164-2
2) FOR TYPICAL HOSE CONN. DETAIL SEE DWG. ME-3170-1
3) FOR GENERAL NOTES SEE DWG. ME-3164-2

APPROVED FOR CONSTRUCTION

COMMONWEALTH EDISON COMPANY
WASTE WATER TREATMENT FACILITIES-WAUKEGAN
EQUIPMENT ARRANGEMENT
COAL PILE RUN-OFF POLYMER BUILDING
NUS CORPORATION ROCKVILLE, MD.
5082 ME 3165 2

07580000123
MICROFILM

83-44

5082ME3172 2

REVISIONS	
REV	DESCRIPTION
1	APPROVED FOR CONSTRUCTION 9/15/72
2	3" GATE VALVE AT POLYMER DRN. WAS SGA54; CHG TO 2GA14.

PLAN
SCALE: 3/8"=1'-0"

SECTION "R-R"

SECTION "Q-Q"

NOTE:
1) EAST YARD POLYMER BUILDING SHOWN, FOR WEST YARD POLYMER BUILDING THE ARRANGEMENT OF EQUIP. & SIZE OF BUILDING WILL BE THE SAME AS EAST BUILDING.
2) FOR HOSE CONN. DETAIL SEE DWG. ME3170-1
3) FOR GENERAL NOTES SEE DWG. ME3164-2

APPROVED FOR CONSTRUCTION

07580000124
MICROFILM

COMMONWEALTH EDISON COMPANY
WASTE WATER TREATMENT FACILITIES - WAUKEGAN
PIPING ARRANGEMENT
YARD: N-438/S-1257
EAST & WEST RUN-OFF POLYMER BUILDINGS
NUS CORPORATION ROCKVILLE, MD
5082ME3172 2
SCALE 3/8"=1'-0" SHT 2 of 3

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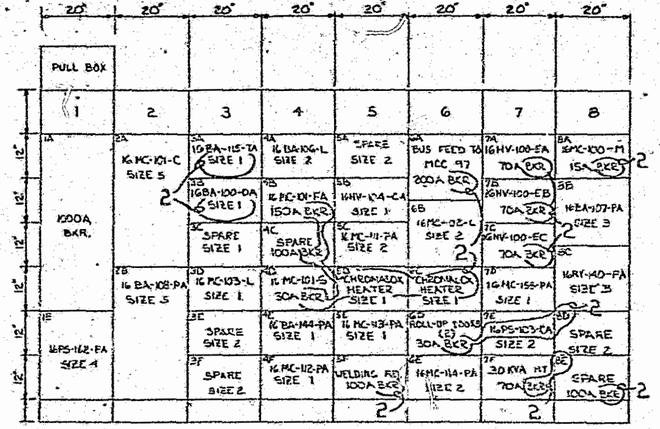
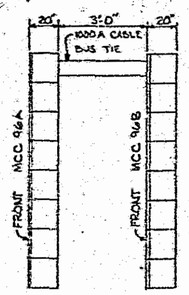
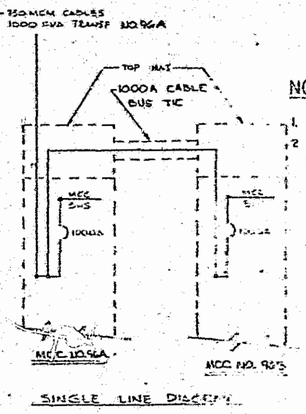
DWG. NO.	5082E6001
SHT. NO.	16E-5343
REV.	2



MCC NO 96A - FRONT VIEW
NTS.



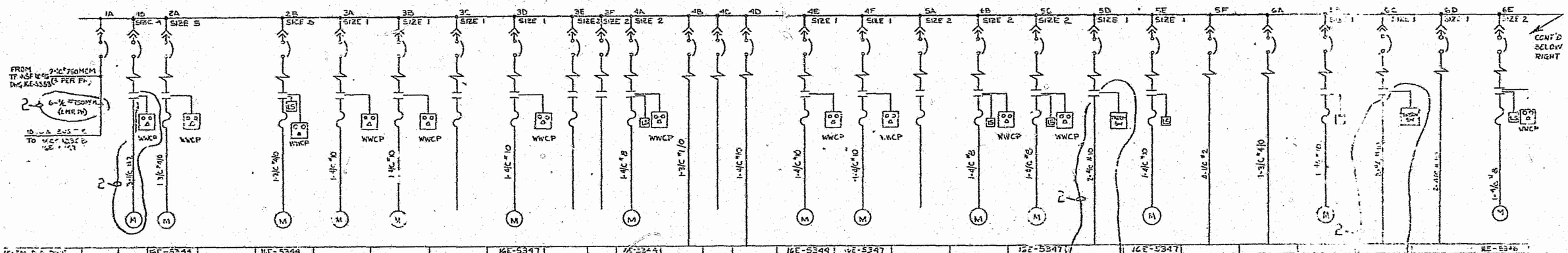
PLAN VIEW
NTS



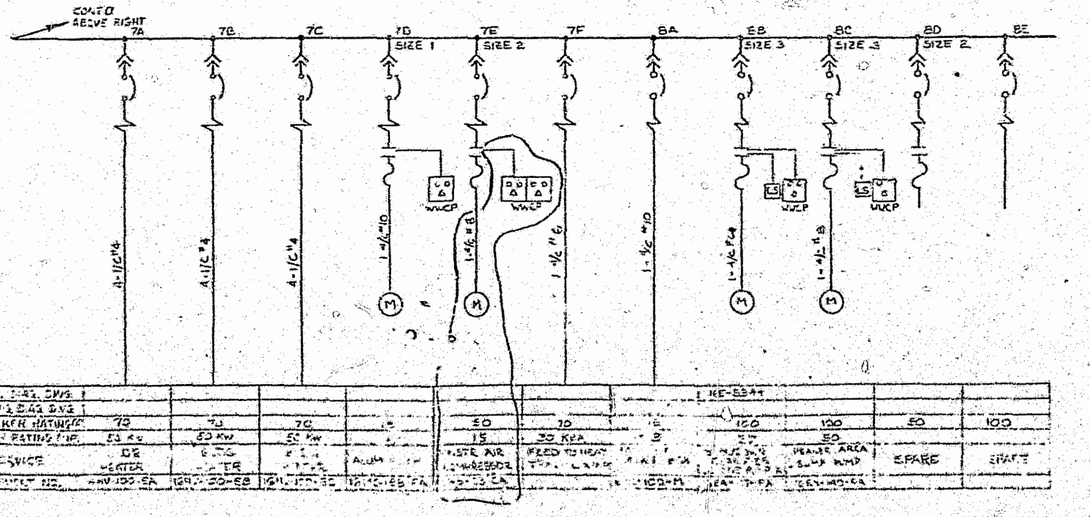
NOTE:
1. WWCP - WASTEWATER CONTROL PANEL
2. JUMPER ACROSS OVERLOADS ON CUBICLES 5D & 6C FOR CHROMALOX HEATERS.

SINGLE LINE DIAGRAM

CENTRAL WASTEWATER MCC NO. 96A.



ELEM. DWG.			16E-5344		16E-5346				16E-5347				16E-5344				16E-5349	16E-5347			16E-5347								16E-5346	
WIRING DIA. DWG.																														
ELEM. RATING (A)	600	150	250		250	15	15	30	30	30	50	60	150	100	30	30	15	15	50	50	50	30	30	100	200	15		30	50	
MOTOR RATING (HP)	200 KVA	60	25		125	2	3		2				7½	92		10	¼	½		1.5	20	(2) 2KW	3			2	(2) 2KW		35	
SERVICE	INCOMING FEEDER	SERVICE WATER	AIR BLOWER		CLARIFIER OVERFLOW SUMP PUMP B	CLARIFIER RAKE DRIVE	CLARIFIER F.E.E. PUMP A	SPARE	OVERFLOW SUMP MIXER	SPARE	SPARE		WASTE SLUDGE OVERFLOW SUMP MIXER	VACUUM FILTER	SPARE	POLY STG. FEED	ACID METERING PUMP A	CAUSTIC METERING PUMP A	SPARE	FLASH MIX TANK AGITATOR	WASTEWATER FEED PUMP B	CHROMALOX HEATER	COLLECTION DRAIN SUMP PUMP A	WELDING RECEPTACLE	BUS FEED TO MCC 97	75 KVA TRANSF. FOR FAN	CHROMALOX HEATER	ROLL UP DOOR (2)	OVERFLOW SUMP PUMP A
EQUIPMENT NO.	1-PS-96-FA	1-MC-101-C			1-BA-108-PA	1-BA-115-TA	1-BA-20-DA		1-MC-103-L				1-BA-108-L	1-MC-101-FA		1-MC-101-S	1-BA-144-PA	1-MC-112-PA		1-MC-102-L	1-MC-111-PA	1-MC-25-T	1-MC-113-PA			1-TR-96-A	1-MC-25-T		1-MC-96-PA	



ELEM. DWG.					16E-5344						
WIRING DIA. DWG.											
ELEM. RATING (A)	70	70	70		50	30		100	100	50	100
MOTOR RATING (HP)	25 KW	50 KW	50 KW		15	30 KVA					
SERVICE	DE HEATER	ELEC. TR			WASTE AIR BLOWER	FEED TO HEAT			PLEASE AREA SUMP PUMP	SPARE	SPARE
EQUIPMENT NO.	1-HV-100-EA	1-TR-20-EB	1-MC-101-EC	1-MC-101-EA				1-BA-103-L	1-MC-96-EA		

DRAWN	D.R.H.	COMMONWEALTH EDISON COMPANY
CHECKED		WASTEWATER TREATMENT FACILITIES
QUALIFICATION		WAUKEGAN
DESIGN ENGINEER		480 VOLT KEY DIAGRAM
APPROVAL		MCC NO 96A
APPROVAL		JOB NO. 80267C DWG. NO. 5082E6001 REV. 2
APPROVAL		16E-5343
F. ENGINEER		SCALE NONE

DRAWING 44-111 2/2/70

07580000125

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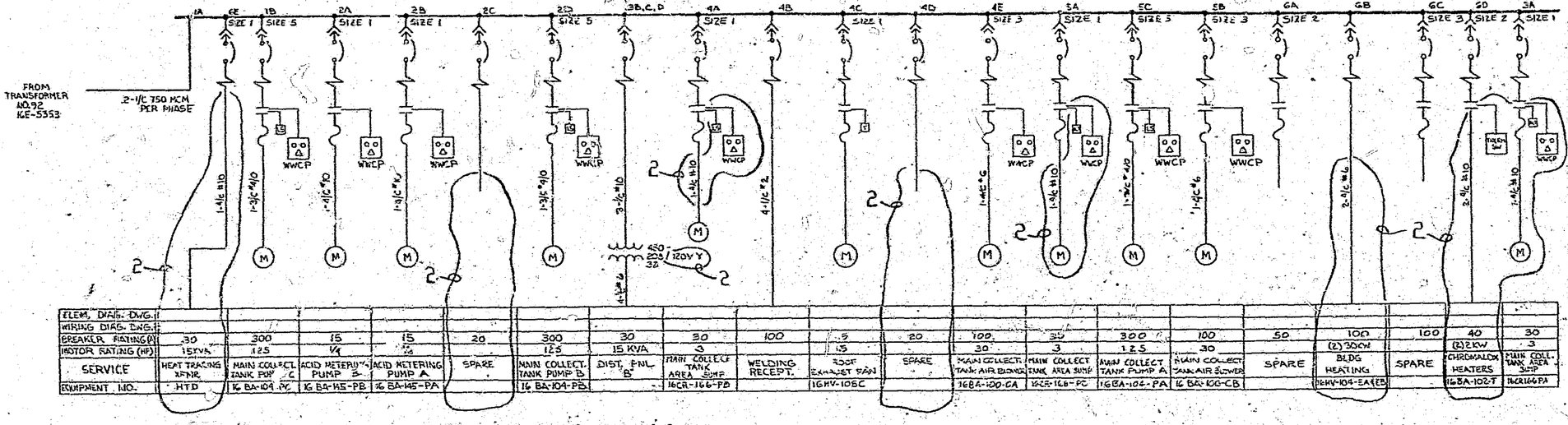
MAIN COLLECTION TANK MCC NO. 92

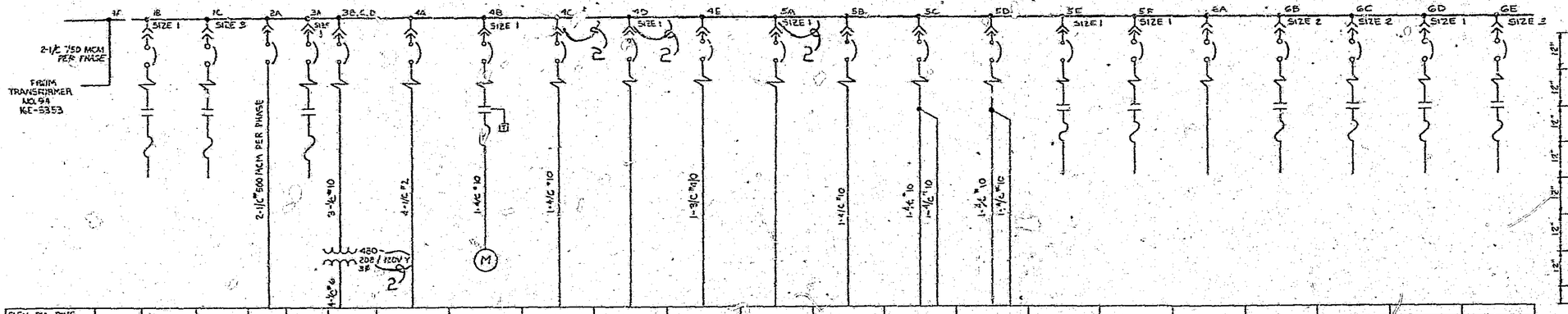


ELEM. DIAG. DWG.#																						
WIRING DIAG. DWG.#																						
BREAKER RATING (A)	30	300	15	15	20	300	30	30	100	15	20	100	30	300	100	50	100	100	40	30		
MOTOR RATING (HP)	15 KVA	125	½	½		125	15 KVA	3		3		30	3	125	30		(2) 30 KW		(2) 2 KW	3		
SERVICE	HEAT TRACING XFMR.	MAIN COLLECT. TANK PUMP C	ACID METERING PUMP B	ACID METERING PUMP A	SPARE	MAIN COLLECT. TANK PUMP B	DIST. PNL. B	MAIN COLLECT TANK AREA SUMP	WELDING RECEPT.	30CF EXHAUST FAN	SPARE	MAIN COLLECT. TANK AIR BLOWER	MAIN COLLECT TANK AREA SUMP	MAIN COLLECT TANK PUMP A	MAIN COLLECT TANK AIR BLOWER	SPARE	BLDG HEATING	SPARE	CHROMALOX HEATERS	MAIN COLL. TANK AREA SUMP		
EQUIPMENT NO.	HTD	16 BA-104-PC	16 BA-145-PB	16 BA-145-PA		16 BA-104-PB		16CR-166-PB		16HV-105C		16BA-100-CA	16CR-166-PC	16BA-104-PA	16 BA-100-CB		16HV-104-EA&EB		16BA-102-T	16CR166PA		

	1	2	3	4	5	6
1A	INCOMING TERMINATIONS	2A 16 BA-145-PB SIZE 1	3A 16CR166PA SIZE 1	4A 16CR166PB SIZE 1	5A 16CR166PC SIZE 1	6A SPARE SIZE 2
2B		2B 16 BA-145-PA SIZE 1	3B 30 CKT DIST. PANEL "B"	4B 100 A BKR	5B 16 BA-100-CB SIZE 3	6B 16HV-104-EA&EB 100 A BKR
2C		2C SPARE 20A BKR		4C 16 HV-108-C SIZE 1	5C 16BA-104-PA SIZE 5	6C SPARE SIZE 3
1B	16 BA-104-PC SIZE 5	2D 16 BA-104-PB SIZE 5	3C 30 A BKR	4D SPARE 20 A BKR		
			3D 15 KVA TRANSF. (VENTED COVER)	4E 16BA-100-CA SIZE 3		6D CHROMALOX HEATERS SIZE 2
						6E HEAT TRACING SIZE 1

MCC NO.92 FRONT VIEW
NTS.

COAL FILE BLDG. MCC NO. 94A

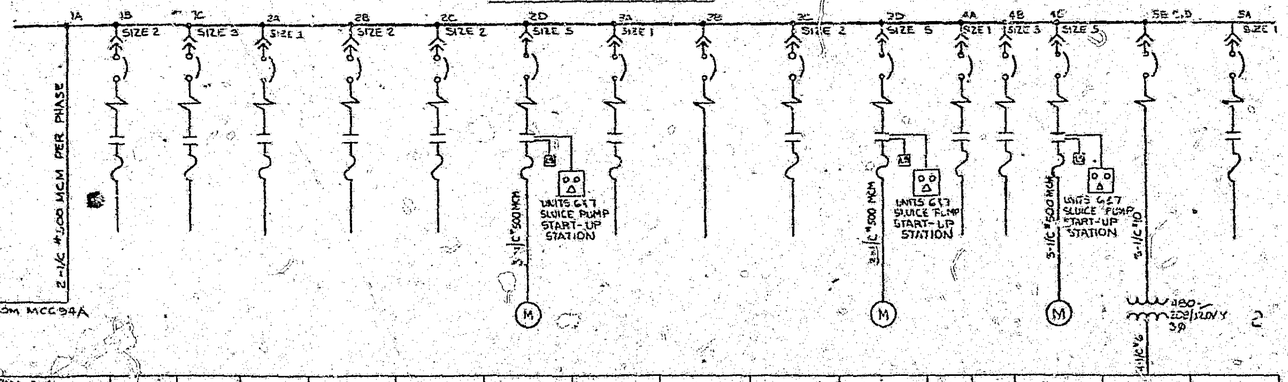


ELEM. DIA. DWG.																						
WIRING DIA. DWG.																						
BREAKER RATING (A)		30	100	800	30	30	100	15	15	15	200	40	30	50	50	15	30	100	50	50	30	100
MOTOR RATING (HP)						15 KVA		¾	3		60		10	(2) 15 KW	(2) 15 KW							
SERVICE	INCOMING TERMINATIONS	SPARE	SPARE	MCC NO 94B FDR	SPARE	DIST. PNL "C"	WELDING RECEPT.	ROOF EXHAUST FAN	MONORAIL FEED	ROLL-UP DOOR	DISCH. PUMP STARTER RACK	COALESCER J.B.	POLYMER FEED	BLDG HEATING	BLDG HEATING	SPARE	SPARE	SPARE	SPARE	SPARE	SPARE	SPARE
EQUIPMENT NO.								16 HV-107-C	16 CR-103-N		16 CR-119 PR1 PB	16 CR-103-S	16 CR-102-S	16 HA-103-EA&EB	16 HV-103-EC &ED							

	1	2	3	4	5	6
1A		2A MCC 94B 800 A BKR	3A SPARE SIZE 1	4A WELD RECEPT 20A BKR	5A 16 CR-109-S SIZE 1	6A SPARE 100 A BKR
1B	SPARE SIZE 1		3B 30 CKT DIST PANEL "C"	4B 16 HV-107-C SIZE 1	5B 16 CR-102-S 20A BKR	6B SPARE SIZE 2
1C	SPARE SIZE 3		3C 30 A BKR	4C 16CR-103-N 15A BKR	5C 16HV-103-EA & EB 50A BKR	6C SPARE SIZE 2
	INCOMING TERMINATIONS			4D ROLL UP DOOR SIZE 1	5D 16HV-103-EC & ED 50A BKR	6D SPARE SIZE 1
			3D 15 KVA TRANSF (VENTED COVER)		5E SPARE SIZE 1	6E SPARE SIZE 3
				STARTER RACK 200 A BKR	5F SPARE SIZE 1	

MCC NO. 94A FRONT VIEW

ASH POND MCC NO. 94B



ELEM. DIAGRAM ENG.																	
WIRING DIA. DWG.																	
BREAKER RATING (A)		30	100	30	50	40	400 / 200	30	100	50	400 / 200	30	100	Alms 200	30	30	
MOTOR RATING (HP)															15 KVA		
SERVICE	INCOMING TERMINATIONS	SPARE	SPARE	SPARE	SPARE	SPARE	ASH POND SLUICE RETURN PUMP A	SPARE	SPARE	SPARE	ASH POND SLUICE RETURN PUMP B	SPARE	SPARE	ASH POND SLUICE RETURN PUMP C	DIST. PNL "D"	SPARE	
EQUIPMENT NO.							16 BA-105-FA				16 BA-105-FB			16 BA-105-FC			

	1	2	3	4	5
1A		2A SPARE SIZE 1	3A SPARE SIZE 1	4A SPARE SIZE 1	5A SPARE SIZE 1
2B		2B SPARE SIZE 2	3B SPARE 100A BKR	4B SPARE SIZE 3	5B 30 CKT DIST. PANEL "D"
2C	INCOMING TERMINATIONS	2C SPARE SIZE 2	3C SPARE SIZE 2	4C 2	
1B	SPARE SIZE 2	2D 16 BA-105-FA SIZE 5	3D 16 BA-105-FB SIZE 5	4D 16 BA-105-FC SIZE 5	5C 30 A BKR
1C	SPARE SIZE 3				5D 15 KVA TRANSF (VENTED COVER)

MCC NO. 94B FRONT VIEW
NTS

NOTES:
1. WWCP - WASTEWATER CONTROL PANEL.
2. IN MCC 94A CUBICLES 4D & 5A AND MCC 92 CUBICLE 6E DISCONNECT STARTERS AND WIRE DIRECTLY TO CIRCUIT BREAKERS. THE SIZE 1 STARTERS SHALL BE KEPT IN PLACE AND SPARED.
3. JUMPER ACROSS OVER-LOAD IN MCC 92 CUBICLE 6D FOR CHROMALOX HEATERS

NO.	DATE	REVISION	BY
2	12-1-77	REVISED AS NOTED	RPH
1	10-14-76	REVISED AS NOTED	DCH
0	8-10-76	ISSUED FOR CONSTRUCTION PER SPEC 1816-5	
2	2-2-76	ISSUED FOR BID SPEC 1816-5	
1	12-17-75	ISSUED FOR BID SPEC 1816-5	
0	4-2-74	ISSUED FOR CLIENT COMMENT	

DRAWN D. RATH 4-2-74
CHECKED
CIVIL ENGINEER
ELECTRICAL ENGR.
MECHANICAL
STRUCTURAL
CHEMICAL ENGR.
GENERAL ENGINEER

COMMONWEALTH EDISON COMPANY
WASTEWATER TREATMENT FACILITIES
WAUKEGAN
480 VOLT KEY DIAGRAM
MCC NO. 92, 94A & 94B
SEC'D CONTRACT 802670 DRAWING NO. 5082E6002 REV. 2
SARGENT & LUNDY ENGINEERS CHICAGO
16E-5352
SCALE NONE SHEET 1 OF 1

07580000126
MICROFILM

STATE OF ILLINOIS

ENVIRONMENTAL PROTECTION AGENCY

The preceding 25 image(s) are partially illegible in the copy sent to be microfilmed. The resulting microfilm may be illegible for use.

Signed: Leon C. Baker

ADM-1041A REV. (4/77)

0758000127
MICROFILM

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1000A BUS TIE TO MCC 96GB SEE PLAN DWG 16E-5343

TOP 4 in.	20"	20"	20"	20"	20"	20"	20"
1	2	3	4	5	6	7	8
1A 1000A BUS FEEDER	2A 16BA-107-PB SIZE 2	2A CHROMALOX HEATER SIZE 1	4A 16BA-104-PA SIZE 1	5A 16MC-104-L SIZE 1	6A 42 CKT DIST PANEL "A"	7A 16HV-100-ED 70A BKR	8A 16BA-107-PB SIZE 3
1B	2B 16BA-100-DB SIZE 3	3B 16RY-144-PA SIZE 3	4B 16MC-112-PA SIZE 1	5B 16MC-113-PB SIZE 1		7B 16HV-103-EE 70A BKR	8B SPARE SIZE 3
1C	2C 16BA-115-TB SIZE 1	3C SPARE SIZE 3	4C 16MC-103-S SIZE 2	5C SPARE SIZE 1		7C 16HV-103-EF 70A BKR	
1D FLANK SPACE	2D 16BA-108-PA SIZE 5	3D 16MC-101-FB 150A BKR	4D 16PS-101-CB SIZE 2	5D SPARE SIZE 1	6B 50A BKR	7D 16HV-100-EG 70A BKR	8C HEAT TRACING SIZE 2
1E 16PS16EPB SIZE 1		3E 16BA-100-S 30A BKR	4E SPARE SIZE 2	5E 16BA-135-PB SIZE 1	6C 30 KVA TRANSF. (VENTED COVER)	7E WELD RECEPT 100A BKR	8D SPARE SIZE 2
			4F 16MC-111-PA SIZE 2	5F 16HV-104-CB SIZE 1		7F SPARE 100A BKR	8E SPARE SIZE 1

MCC NO. 96B - FRONT VIEW
W.T.S.

NOTES:
1. WWCP = WASTEWATER CONTROL PANEL.
2. IN MCC 96B CUBICLE 8C DISCONNECT STARTER AND WIRE DIRECTLY TO CIRCUIT BREAKER. STARTER SHALL BE KEPT IN PLACE AND SPARED.
3. JUMPER ACROSS OVERLOAD IN CUBICLE 3A FOR CHROMALOX HEATER.

CENTRAL WASTEWATER MCC NO. 96B

1000A BUS FROM MCC 96A 16E-5343

1A SIZE 1 · 1C SIZE 1 · 2A SIZE 2 · 2B SIZE 4 · 2C SIZE 1 · 2E SIZE 5 · 3A SIZE 1 · 3B SIZE 3 · 3C SIZE 3 · 3D · 3E · 4A SIZE 1 · 4B SIZE 3 · 4C SIZE 1 · 4D SIZE 2 · 4E SIZE 3 · 4F SIZE 2 · 5A SIZE 1 · 5B SIZE 1 · 5C SIZE 1 · 5D SIZE 1 · 5E SIZE 1 · 5F SIZE 1 · 6A,B,C · 7A · 7B

WWCP · LOCAL · LS · M · 480-208 1RDY Y 30

CONT'D BELOW LEFT

ELEM. DIAG. DWG			16E-5346									16E-5344	16E-5345					16E-5347	16E-5346	16E-5347								
WIRING DIAG. DWG.																												
BREAKER RATING (A)	1600	150	30	15	15				30	100	100	150	30	15	45	30	50		50	15	30	20	30	15	15	30	70	70
MOTOR RATING (HP)	2000 KVA	60	15	3	7½				(2) .5KW	50		90	10	¼	½	10	15		20	1½	3			¼	3	30 KVA	50 KW	50 KW
SERVICE	INCOMING	SERVICE WATER	UNDERFLOW SLUDGE PUMP	CLAR. TURBINE PUMP B	CLAR. TURBINE PUMP A		BLANK SPACE		CHROMALOX HEATERS	PRIMER AREA SUMP PUMP	SPARE	VACUUM FILTER	POLY SYSTEM FEED	ACID METERING PUMP B	CAUST. METERING PUMP B	SLUDGE CONVEYOR	INSTR. AIR COMPRESSOR	SPARE	WASTEWATER FEED PUMP A	SLUDGE HOLDING TANK MIXER	COLLECTION DR. SUMP PUMP B	SPARE	SPARE	ALUM PUMP	ROOF EXHAUST FAN	DISTRIBUTION PANEL 'A'	SLDG. HEATING	SLDG. HEATING
EQUIPMENT NO.		16PS16EPB	16MCHM-PB	16BA-100-DB	16BA-115-TB				16MC-103-T	16RYM3-PB		16MC-101-FB	16BA-108-PA	16BA-144-PB	16VC-101-FB	16VC-105-S	16PS-103-CB		16MC-111-PB	16MC-104-L	16MC-113-PB			16BA-138-PB	16HV-104-CB		16HV-100-ED	16HV-100-EE

CONT'D FROM ABOVE RIGHT

7C · 7D · 7E · 7F · 8A SIZE 3 · 8B SIZE 3 · 8C SIZE 2 · 8D SIZE 2 · 8E SIZE 1

LS · WWCP · M

ELEM. DIAG. DWG.						16E-5344					
WIRING DIAG. DWG.											
BREAKER RATING (A)		70	70		30	100	100	50	50	15	
MOTOR RATING (HP)		50KW				30		30KVA			
SERVICE		BUILDING HEATER	WELD. RO RECEPT.			BLOWDOWN CLR SLUDGE PUMP	SPARE	HEAT TRACING XFMR	SPARE	SPARE	
EQUIPMENT NO.		16HV-100-EG				16BA107-PB		HTC			

	DATE	REVISION	BY
8	12-6-77	REVISED AS NOTED	KFH
7	10-14-76	REVISED AS NOTED	"
6	5-10-76	ISSUED FOR CONSTRUCTION PER SPEC M916	"
5	2-9-76	REVISED AS NOTED PER SPEC M916	"
4	1-30-76	ISSUED FOR BID PER SPEC M916	"
3	11-21-75	ISSUED FOR PLANT CONVENIENCE	"

DESIGN J.B.	DATE 10/75	COMMONWEALTH EDISON COMPANY WASTEWATER TREATMENT FACILITIES WAUKEGAN
CHECKED		480 VOLT KEY DIAGRAM MCC NO 96B
QA ENGINEER		
SUPV. MECH. ENGR.		
ELECTRICAL		
APPROVAL		
APPROVAL PROJ. MGR.		
APPROVAL CONST.		

802670 · SHT. NO. 5082E6004 · 2
ACECO CORPORATION · ROCKVILLE, MD. · SCALE: NONE · 16E-5357 · SHEET 1 OF 1

07580000128
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2	16E-5358
	50826003

WEST RUNOFF POLYMER SYSTEM MCC NO. 97

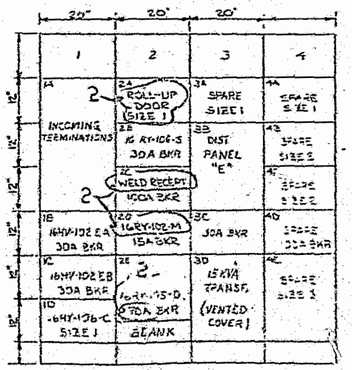
FROM MCC NO. 96A 16E-5343 — 3-1/C #4/0 IN 2" CONDUIT

	1A	1B	1C	1D	2A	2B	2C	2D	2E	3A	3B, C, D	4A	4B	4C	4D	4E
ELEM. DIA. DWG.																
WIRING DIA. DWG.																
BREAKER RATING (A)		30	30	15	30	30	100	15	30	30	30	30	50	50	100	100
MOTOR RATING (HP)		15 Kw	15 Kw	1/2		10		3	30		15 KVA					
SERVICE	INCOMING TERMINATIONS	BLDG. HTG.	BLDG. HTG.	ROOF EXHAUST FAN	ROLL-UP DOOR	POLYMER FEED	WELDING REC.	MONORAIL FEEDER	OIL SEPARATOR STARTER	SPARE	DIST. PNL. "E"	SPARE	SPARE	SPARE	SPARE	SPARE
EQUIPMENT NO.		16HV-102-EA	16HV-102-EB	16HV-106-C		16RY-106-S		16RY-102-M	16RY-105-D							

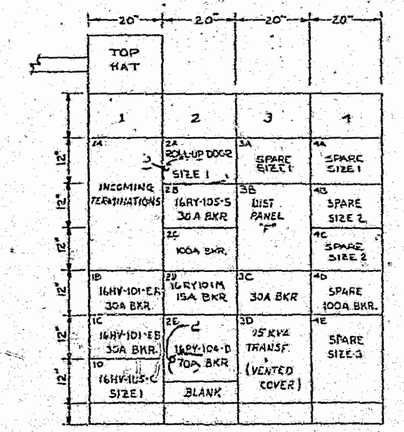
EAST RUNOFF POLYMER SYSTEM MCC NO 98

HOLD — FROM POLE MOUNTED TRANSFORMER 1-3/C #4/0

	1A	1B	1C	1D	2A	2B	2C	2D	2E	3A	3B, C, D	4A	4B	4C	4D	4E
ELEM. DIA. DWG.																
WIRING DIA. DWG.																
BREAKER RATING (A)	225	30	30	15	30	30	100	15	70	30	30	30	50	50	100	100
MOTOR RATING (HP)		15 Kw	15 Kw	1/2		10		3	30		15 KVA					
SERVICE	INCOMING TERMINATIONS	BLDG. HTG.	BLDG. HTG.	ROOF EXHAUST FAN	ROLL-UP DOOR	POLYMER FEED	WELDING REC.	MONORAIL FEEDER	OIL SEPARATOR STARTER	SPARE	DIST. PNL. "F"	SPARE	SPARE	SPARE	SPARE	SPARE
EQUIPMENT NO.		16HV-101-EA	16HV-101-EB	16HV-105-C		16RY-105-S		16RY-101-M	16RY-104-D							



MCC NO 97 FRONT VIEW
N.T.S.



MCC NO 98 FRONT VIEW
N.T.S.

NOTES:
1. IN MCC 97 CUBICLE 2A AND MCC 98 CUBICLE 2A CONNECT ROLL-UP DOORS DIRECTLY TO 30A BKR AND KEEP SIZE 1 STARTER UNIT IN PLACE AS SPARE.

2	12-1-92	SEE SEO AS NOTED
1	10-14-92	REVISED AS NOTED
0	8-26-92	ISSUED FOR CONSTRUCTION PER SPEC #92E
C	2-9-92	ISSUED FOR CONSTRUCTION PER SPEC #92E
B	1-17-92	ISSUED FOR BID PER SPEC #92E
A	11-7-91	ISSUED FOR CONSULTANT REVIEW
	DATE	REVISION

DRAWN	D. RATH	9/91
CHECKED		
COG. ENGINEER		
DISCIPLINE APPVL.		9/91
APPROVAL		
APPROVAL		
APPROVAL FROM		
APPROVAL AGENCY		

COMMONWEALTH EDISON COMPANY
WASTEWATER TREATMENT FACILITIES
WAUKEGAN
480 VOLT KEY DIAGRAM
MCC NO. 97 & 98

CECO CONTRACT 802670 | VPE NO. 50826003 | 2

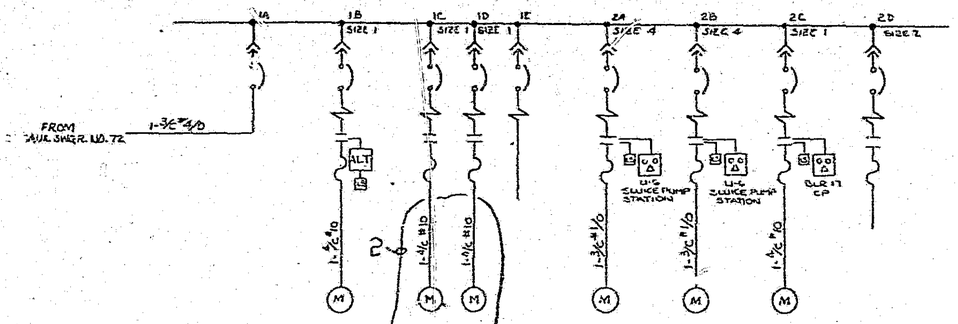
DRAWING NO. 16E-5358

SARGENT & LUNDY | ROCKVILLE MD. | SCALE NONE | SHEET OF

07580000129
MICROFILM

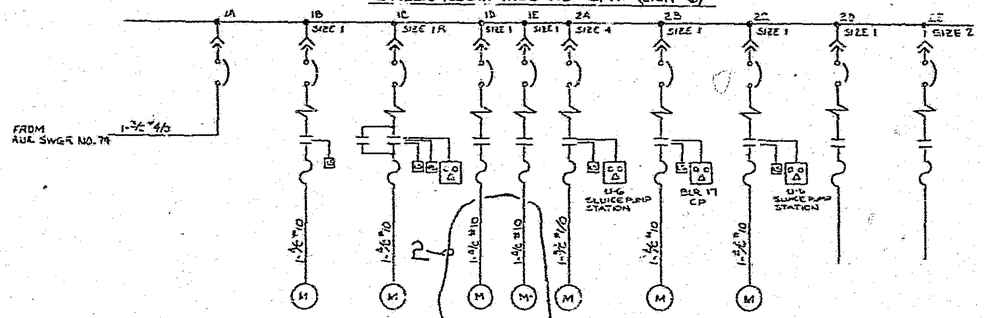
Electronic Filing: Received, Clerk's Office 10/31/2022

BOILER ROOM MCC NO. 6A3 (UNIT 6)

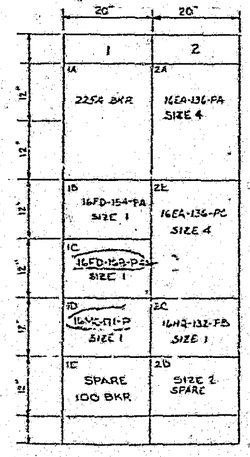


ELEM. DIAG. DWG.		16E-5362						16E-5362		
WIRING DIAG. DWG.										
BREAKER RATING (A)	225	15	30	30	100	150	150	15	50	
MOTOR RATING (HP)		3				60	60	2		
SERVICE	INCOMING	U5 BLR RM FL. DRAIN SUMP	OIL SKIMMER	ASH PIT SUMP PUMP	SPARE	ECONOMIZER FLYASH PUMP	ECONOMIZER FLYASH PUMP	U6 FLASH TK DRAIN PUMP	SPARE	
EQUIPMENT NO.		16FD-154-PA	16FD-169-P	16MC-171-P		16EA-135-PA	16EA-135-PC	16HQ-132-PB		

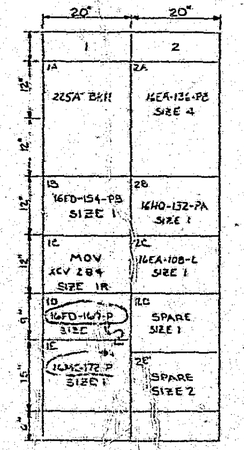
BOILER ROOM MCC NO 6A4 (UNIT 6)



ELEM. DIAG. DWG.							16E-5362			
WIRING DIAG. DWG.										
BREAKER RATING (A)	225	15	15	30	30	150	15	15	30	50
MOTOR RATING (HP)		3	5			60	2	2		
SERVICE	INCOMING	U5 BLR RM FL. DRAIN SUMP	MOTOR OPER. VALVE	OIL SKIMMER	ASH PIT SUMP PUMP	ECONOMIZER FLYASH PUMP	U6 FLASH TK DRAIN PUMP	EFA MIXER	SPARE	SPARE
EQUIPMENT NO.		16FD-154-PB	XCV-284	16FD-169-P	16MC-172-P	16EA-136-PB	16HQ-132-PA	16EA-108-L		



MCC NO6A3-FRONT VIEW
N.T.S.



MCC NO6A4-FRONT VIEW
N.T.S.

REV	DATE	REVISION	BY
E	11-04-19	REVISED AS NOTED	
D	8-10-18	REVISED AS NOTED	
C	7-31-18	REVISED PER CONSTRUCTION FOR SPEC NOTE 5	
B	7-31-18	REVISED AS NOTED	
A	11-17-17	ISSUED FOR CLIENT COMMENT	

COMMONWEALTH EDISON COMPANY
WASTEWATER TREATMENT FACILITIES
WAUKEGAN
480 VOLT KEY DIAGRAM
MCC NO 6A3 & 6A4

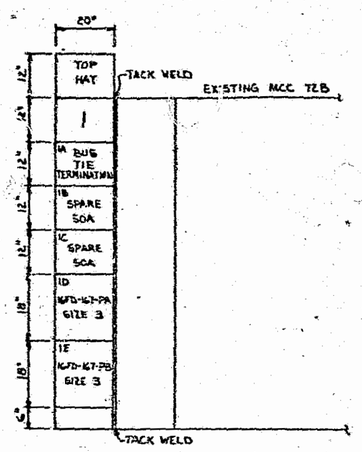
CECO CONTRACT 802670 | SIZE D | DRG NO 5032E6005 | REV E
DRAWING NO 16E-5359
SCALE NONE | SHEET 1 OF 1

07580001130
MICROFILM

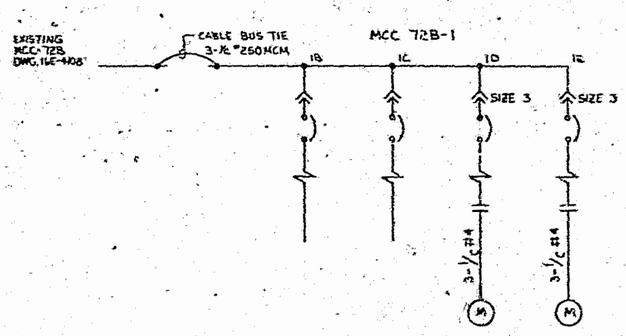
Electronic Filing: Received, Clerk's Office 10/31/2022

NO.	DWG. NO.	REVISION
1	5082E6007	

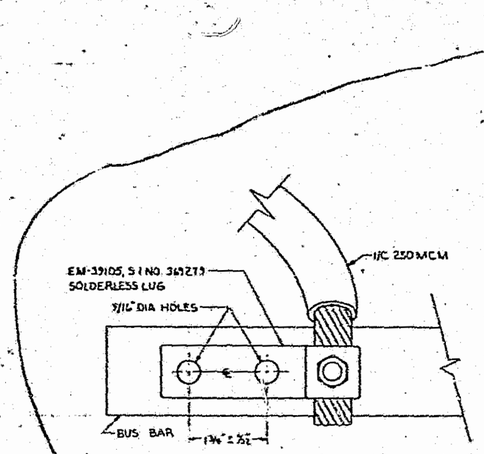
16E-5412



MCC 72B-1 FRONT VIEW (NTS)

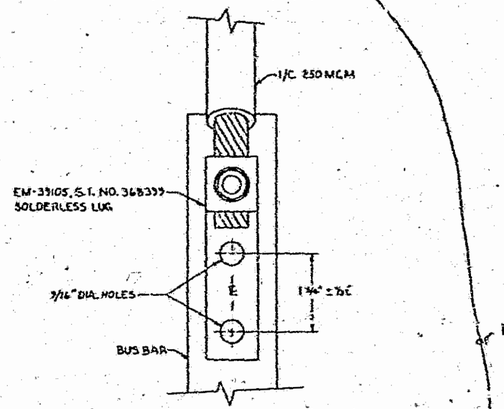


ELEM. DIAGRAM DWG.				
WIRING DIA. DWG.				
BREAKER RATING (A)	50	50	100	100
MOTOR RATING (HP)			40	40
SERVICE	SPARE	SPARE		
EQUIPMENT NO.			K-FD-167-PA	K-FD-167-PB



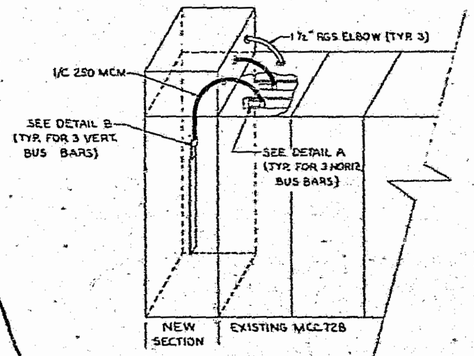
NOTE: USE DURIUM BOLT; 1/2"-13NC-1 1/4"L HEX HEAD. DURIUM NUT; 1/2"-13NC HEX HEAD BURNDY CAT NO FN43T13 OR EQUAL. DURIUM 1/2" SHAKEPROOF LOCKWASHER

DETAIL A
SCALE: 3/4"=0"-1"



NOTE: USE DURIUM BOLT; 1/2"-13NC-1 1/4"L HEX HEAD. DURIUM NUT; 1/2"-13NC HEX HEAD BURNDY CAT NO: FN43T13 OR EQUAL. DURIUM 1/2" SHAKEPROOF LOCKWASHER.

DETAIL B
SCALE: 3/4"=0"-1"



BUS TIE-INS
NO SCALE

NO.	DATE	REVISION	BY
1	1-22-79	ADD BUS TIE-IN DETAIL	KPK
0	12-27-78	ISSUED FOR CONSTRUCTION	KPK

DRAWN	CUTSHAW	9-29-78
CHECKED		9-29-78
ENGINEER		9-29-78
CHECKED		9-29-78
APPROVED		9-29-78

COMMONWEALTH EDISON COMPANY
WASTEWATER TREATMENT FACILITIES
WAUKEGAN

480V KEY DIAGRAM
MCC NO. 72B-1

FILE CONTENT	802670	DWG. NO. 5082E6007
NUS CORPORATION ROCKVILLE, MD		16E-5412
SCALE NONE	SHEET	REV.

515

07580000131
MICROFILM

Electronic Filing: Received, Clerk's Office 10/31/2022

WAUKEGAN

075800001 32
MICROFILM

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STATE OF ILLINOIS

ENVIRONMENTAL PROTECTION AGENCY

The preceding 5 image(s) are partially illegible in the copy sent to be microfilmed. The resulting microfilm may be illegible for use.

Signed: Leon C. Baker

ADM-1041A REV. (4/77)

0758000133
MICROFILM

Electronic Filing: Received, Clerk's Office 10/31/2022

Electronic Filing: Received, Clerk's Office 10/31/2022

PLAN MICROFILM "JACKET" INFORMATION

1. Division Code: W
2. FIPS County Code: 097
3. City/Township Code: 190
4. Governing Body Code: 0500A
5. Permittee Name: COMMONWEALTH EDISON-WAUKEGAN NONTHE
6. File Division: 04
7. IEPA Permit Number: 1977EB3699--

CROSS-REFERENCE INFORMATION

8. Governing Body Name: COMMONWEALTH EDISON COMPANY---
9. F/S/P Code: B0133---

04SCCC00159

DWPC Records Unit
RU-6 (11-77)

Electronic Filing: Received, Clerk's Office 10/31/2022

DWG. NO. SK-2-9-77 REV.

PROCESS FLOWS

FLOW 6.84x10⁶

MAKE UP
FLOW 3.9x10⁶GPD

BOTTOM & ECONOMIZER ASH TRANSPORT SYSTEM

FLOW 10.74x10⁶GPD
SS 533,800 PPD

DEWATERING BINS

SS 267,990 PPD

OFF SITE SLUDGE DISPOSAL

ASH PONDS

FLOW GOO
SS NEGLI

ACID FEED

POLYME
FEED

DEMINERALIZER FILTER BACKWASH

FLOW .17x10⁶ GPD
SS 12 PPD

ASH SYSTEM SOLIDS

SS 265315 PPD

SOLIDS HAULED OFF SITE

CAUSTIC FEED

FLOW AS NEEDED
SS NEGLIGIBLE

GAS SIDE CLEANING WASTE SYSTEM

FLOW 1.6 x10⁶ GPD
SS 137,000 PPD

DEMINERALIZER REGENERANT WASTES

FLOW 56,000 GPD
SS ≤ 7 PPD (≤15 mg/ℓ)

RECYCLE TO DEMINERALIZERS
FLOW .293x10⁶GPD

MAKEUP WATER

BOILER BLOWDOWN & DRAINS

FLOW 6,360 GPD
SS 1 ppm

COLLECTION

CONTAMINATED FLOOR DRAINS

FLOW 0.5x10⁶GPD
SS 2100 PPD
OIL VARIABLE

OIL SEPARATOR

OIL VARIABLE

OIL HAULED OFF SITE

FLOW 0.5 x 10⁶ G
SS 420 PPD
OIL VARIABLE

POLYMER FEED

FL
SS

CONTAMINATED ROOF & YARD RUNOFF

FLOW 1.5x10⁶GPD
SS VARIABLE
OIL VARIABLE

NON PROCESS FLOWS

CONTAMINATED ROOF & YARD RUNOFF

FLOW 1.2x10⁶GPD
SS VARIABLE
OIL VARIABLE

FLOW 1200 GPD
SS NEGLIGIBLE

POLYMER FEED

COAL PILE RUNOFF

FLOW 1.08x10⁶ GPD
SS VARIABLE
OIL VARIABLE

FLOW 1080 GPD
SS NEGLIGIBLE

POLYMER FEED

EDISON - WAUKEGAN STATION
COMMONWEALTH EDISON
Log # 3699-77
Permit # 1977-EB-3699

04960000160

BRUNING 28010

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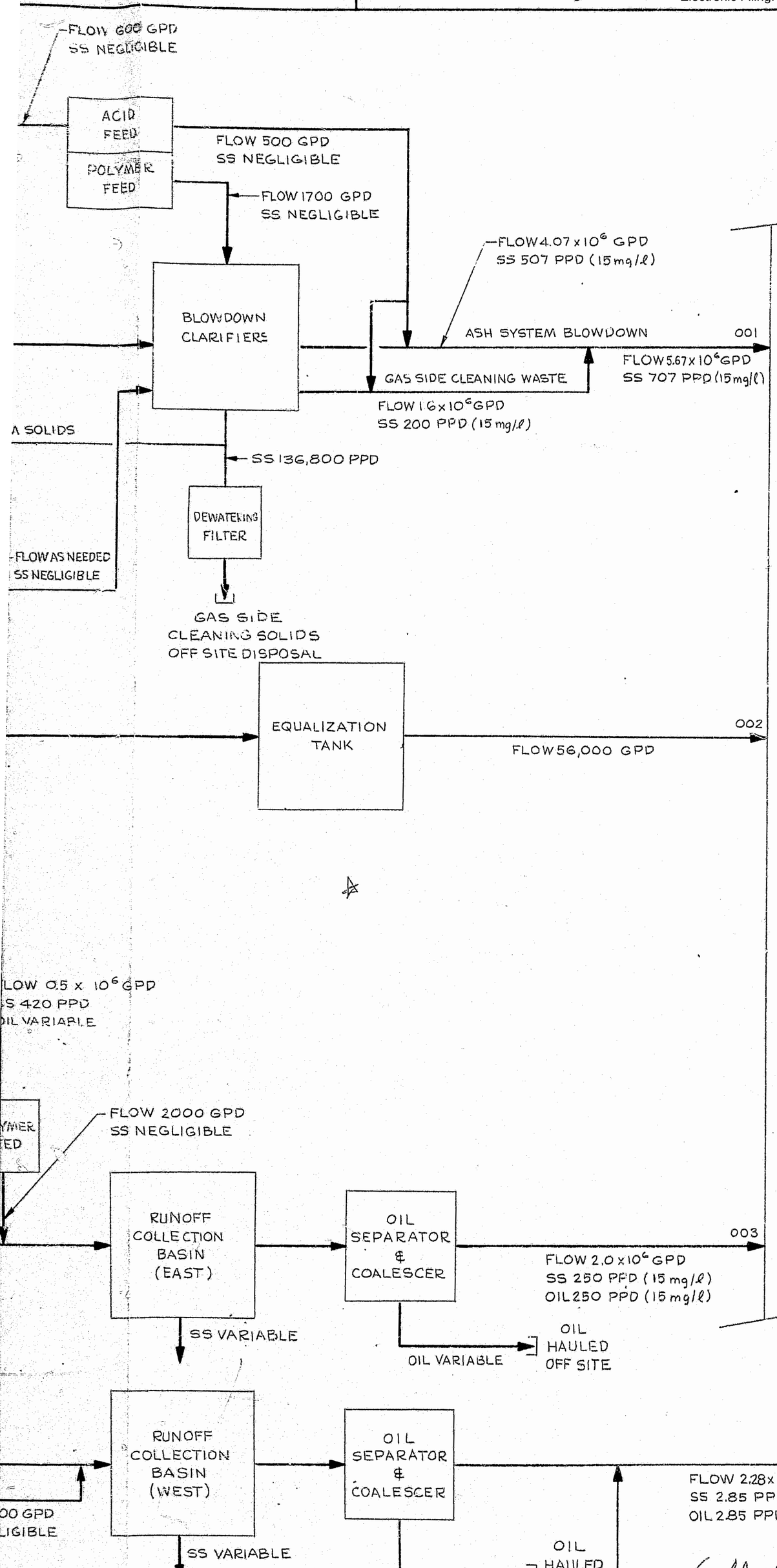


PARTS LIST					
REF	ITEM	DESCRIPTION	REQ'D	IDENTIFICATION	
				MATERIAL	PART NO. OR SPECIFICATION

REVISIONS	
REV.	DESCRIPTION

NOTES

1. ALL FLOWS ARE NORMALLY INTERMITTENT WITH THE EXCEPTION OF ASH TRANSPORT SYSTEM
2. ALL FLOWS, LOADS & CONCENTRATIONS ARE ESTIMATED AVERAGE VALUES AND REFLECT DAILY VALUES WHEN SYSTEMS ARE IN OPERATION
3. ALL RUNOFF FLOWS BASED ON 10 YEAR 24 HOUR STORM, EXCESS AMOUNTS ARE NOT TREATED
4. GPD INDICATES GALLONS PER DAY
5. PPD INDICATES POUNDS PER DAY
6. SS INDICATES SUSPEND SOLIDS
7. mg/ℓ INDICATES MILLIGRAMS PER LITER.
8. ASH POND SOLIDS HAULED AWAY 4 TIMES/YEAR
9. OIL HAULED AWAY ON A "WHEN NECESSARY BASIS."
10. CAUSTIC IS USED IN THE GAS SIDE CLEANING WASTE SYSTEM TREATMENT AS ON A "AS NEED BASIS."
11. ALL SLUDGE VALUES REPORTED ON A DRY POUNDS BASIS. WATER REMOVED WITH SLUDGE IS NEGLIGIBLE COMPARED TO DAILY FLOWS.
12. 001 REPRESENTS ASH TRANSPORT BLOWDOWN & AIR HEATER WASH COMBINED DISCHARGE DURING PROCESSING OF AIR HEATER WASTE.
13. 003 REPRESENTS A SINGLE DISCHARGE NUMBER FOR 2 DISCHARGE POINTS.

RECEIVED
MAR 30 1977
ENVIRONMENTAL PROTECTION AGENCY
DIV. OF WATER POLLUTION CONTROL
RECORDS UNIT — SPRINGFIELD
STATE OF ILLINOIS

DRAWING STATUS: PRELIMINARY

04960000161

	Date
DRAWN	2/16/77
CHECKED: J.R King	2/17/77
COG. ENGINEER	
DISCIP. MGR. APPVL.	
APPROVAL, ____	
APPROVAL, ____	
APPROVAL, PROJ.	
APPROVAL, CLIENT	

COMMONWEALTH EDISON COMPANY
WASTE WATER TREATMENT FACILITIES - WAUKEGAN

WAUKEGAN POWER STATION
FLOW AND MASS DIAGRAM

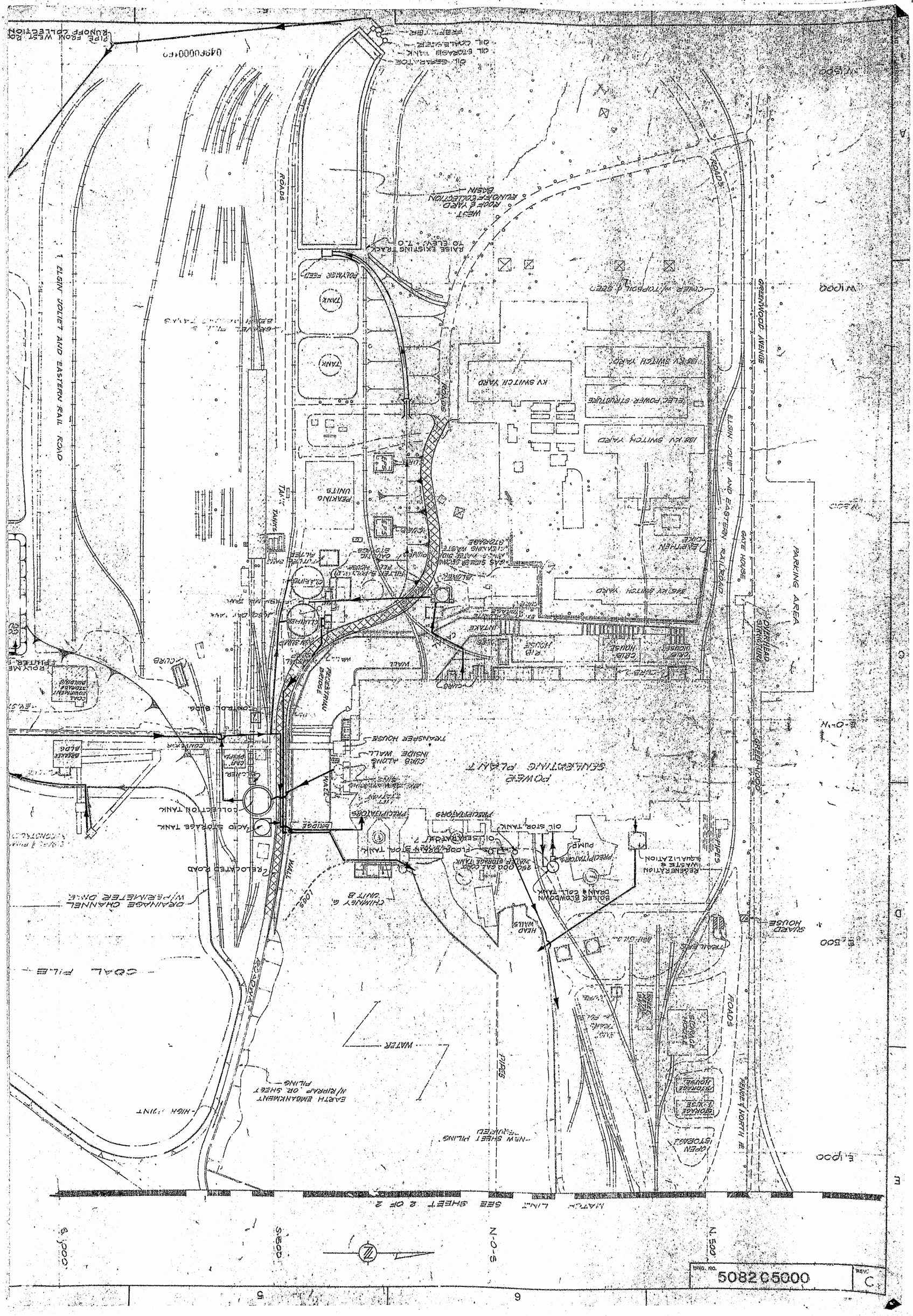
802670

NUS CORPORATION
ROCKVILLE, MD.

DRAWING NO. SK-2-9-77

SCALE: NONE

SHEET 1 OF 1


ELSIN JOLIET AND EASTERN RAIL ROAD
GREENWOOD AVENUE
ROADS
PIPES
PARKING AREA
GATE HOUSE
GUARD HOUSE
KV SWITCH YARD
138 KV SWITCH YARD
345 KV SWITCH YARD
PEAKING UNITS
TANKS
COAL PILE
CHIMNEY & UNIT 3
CHIMNEY & UNIT 2
TRANSFER HOUSE
CONTROL BLDG.
COAL CRUSHER HOUSE
COAL CONVEYOR
COAL SAMPLER HOUSE
COAL CONVEYOR TUNNEL
COAL CONVEYOR TOWER
COAL CONVEYOR TRESTLE
COAL CONVEYOR TRANSFER HOUSE
COAL CONVEYOR TRANSFER TOWER
COAL CONVEYOR TRANSFER TUNNEL
COAL CONVEYOR TRANSFER TRESTL

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4 3 2 1

S.1500 S.2000 S.2500

LAKE MICHIGAN
GREENWOOD AVE
SITE
ELGIN JOLIET & EASTERN R.R.
CHICAGO & N. WESTERN R.R.
SHERIDAN RD
VICINITY MAP 1"=2000'

REVISIONS		
REV.	DESCRIPTION	
A	INITIAL RELEASE	
B	ISSUED FOR CLIENT CONCEPT REVIEW SYST. ENGR. [illegible] COG. PROC. [illegible] COG. CIV. [illegible] P.E. [illegible]	1"=1/2"
C	MISCL. CHANGES & ADDNS. ACM-D.W.S. [illegible]	2/14/77

WATER
SLUDGE AREA
PLANT WATER
WEIR
[illegible] Ø SUMP DISCHARGE TO BE SEALED
SUMP & PUMPS
LINED ASH POND #2
CENTRIFUGAL SEPARATOR & SUMPS & PUMPS
2-FLUME
POLYMER FILTER FIELD
COAL PILE RUN-OFF BASIN
SUMP
LINED ASH POND #1
WEIR
ASH POND 1
ROADS
EL 590.00
W 475.00
COVER W/TOPSOIL & SEED
ROADS
EXIST. 6' FENCE
DITCH
PROPERTY LINE
WEST ROAD & YARD COLLECTION BASIN

NOTES:
1. THIS PLAN IS TO BE USED FOR PRELIMINARY EQUIPMENT LOCATION ONLY AND IS NOT INTENDED TO BE USED FOR CONSTRUCTION.
2. EXISTING FEATURES AS HEREON INDICATED ARE FROM TOPOGRAPHIC SURVEY BY AERO-METRIC ENGINEERING - DATED NOVEMBER 15, 1974 AND UPDATED INFORMATION FROM NUS SITE VISIT IN APRIL AND MAY 1976.

04960000163

DRAWING STATUS: PRELIMINARY

	Date
DRAWN [illegible]	6/11/1976
CHECKED [illegible]	6/11/1976
COG. ENGINEER	
DISCIP. MGR. APPVL.	
APPROVAL PROC. IS	
APPROVAL	
APPROVAL	
APPROVAL PROJ.	

COMMONWEALTH EDISON COMPANY
WASTE WATER TREATMENT FACILITIES
WAUKEGAN

LOCATION AND PLOT PLAN

CECO CONTRACT 80267D | CECO DWG. NO. | REV.

NUS CORPORATION ROCKVILLE, MD.

DRAWING NO. 5082 C 5000 | REV. C

SCALE: 1" = 100' | SHEET 1 OF 2

000 IN

E 2600

E 2050

E 1500

0496000164

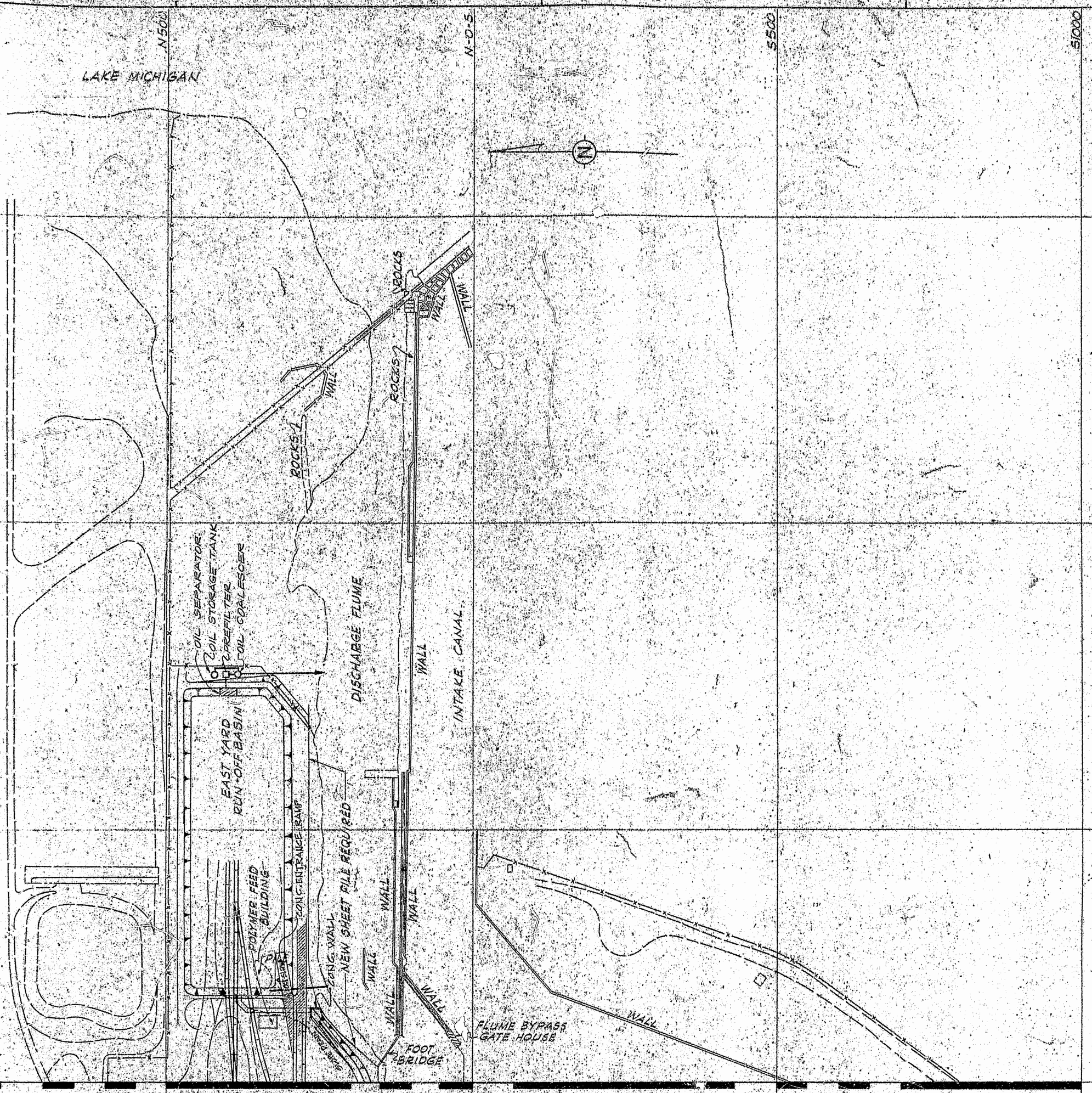
DWG. NO. 5082 C5000

REV. C

Electronic Filing: Received, Clerk's Office 10/31/2022

Electronic Filing: Received, Clerk's Office 10/31/2022

REVISIONS	
REV.	DESCRIPTION
A 11/30/78	ISSUED FOR CLIENT CONCEPT REVIEW. BY ST. ENGR. C.G. Kim COG PROC. J.R. Mitchell COG CIVIL L.J. Lawrence P.E. L.C.S.
B 1/24/79	MISC'L EQUIPMT. CHANGED. A.K.M. D.B.S.
C 7/14/79	MISCELLANEOUS EQUIP. REVISIONS. A.K.M. D.B.S.



FOR NOTES, SEE SHEET NO. 1 OF 2

04960000165

DRAWING STATUS: PRELIMINARY

	Date
DRAWN: L. Hulanicky	11/29/78
CHECKED: J.R. Mitchell / L.C. Lawrence	11/29/78 / 11/29/78
COG. ENGINEER	
DIECIP. MGR. APPVL.	
APPROVAL	
APPROVAL	
APPROVAL, PROJ.	
APPROVAL, CLIENT	

COMMONWEALTH EDISON COMPANY
WASTE WATER TREATMENT FACILITIES
WAUKEGAN

LOCATION AND PLOT PLAN

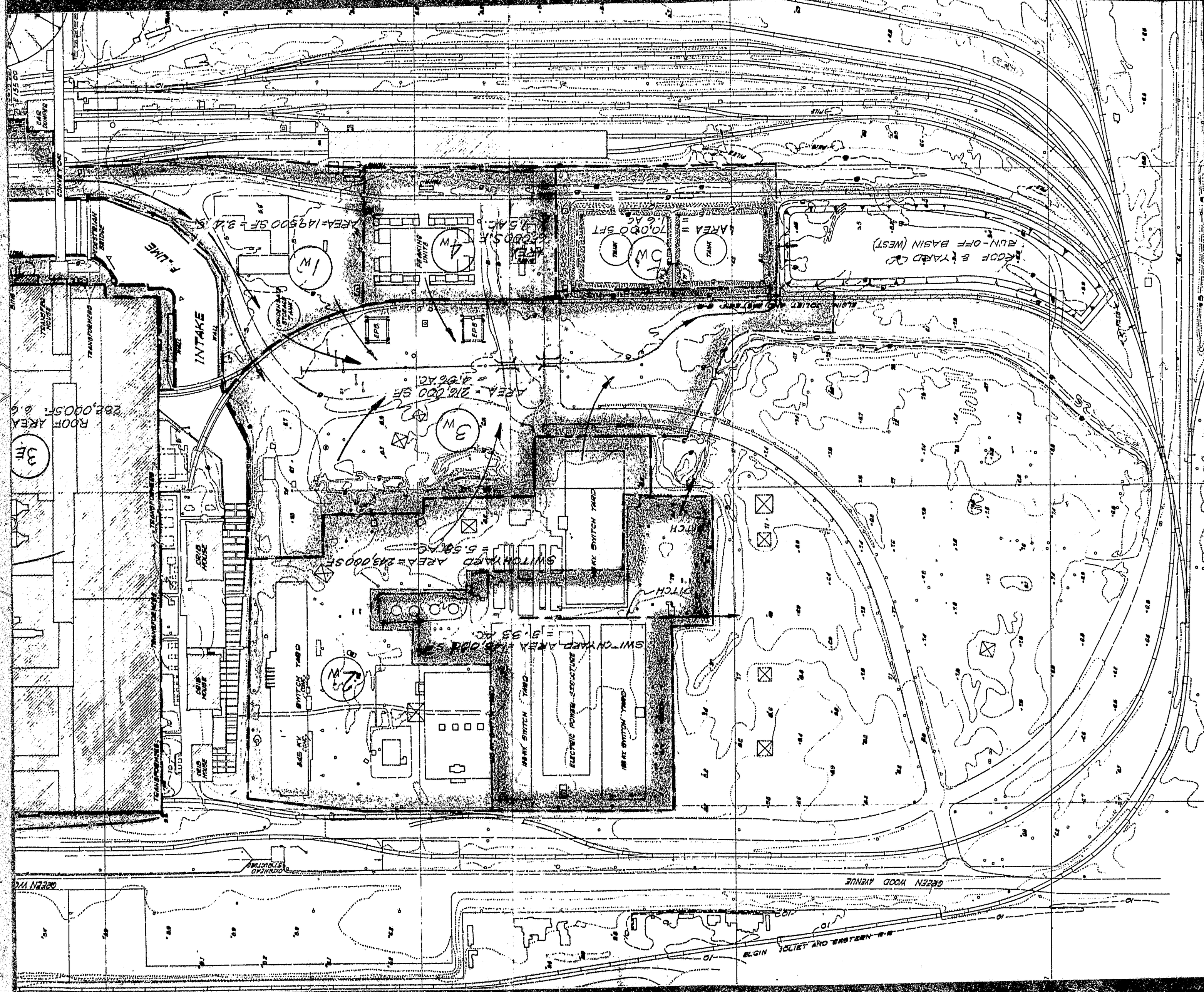
CECO CONTRACT: 802670 | CECO DWG. NO. | REV.

NUS CORPORATION, ROCKVILLE, MD.

DRAWING NO. 5082C5000 REV. C

SCALE: 1" = 100' SHEET 2 OF 2

Electronic Filing: Received, Clerk's Office 10/31/2022


INTAKE
F.LINE
TRANSITION HOUSE
CRIB HOUSE
CRIB HOUSE
CRIB

Electronic Filing: Received, Clerk's Office 10/31/2022

INTAKE POND

DISCHARGE FLUME

SHEET PILING

YARD RUN-OFF BASIN (EAST)

1E

YARD AREA 511,600 S.F. ± 11.74 AC.

STORAGE HOUSE

STORAGE HOUSE

STORAGE HOUSE

SHEET PILING

DISCHARGE FLUME

FOOT BRIDGE

FLUME BYPASS GATE HOUSE

INTAKE POND

N136
E554

EARTHEN DIKE

GREENWOOD AVENUE

RECHARGE AREA DRAIN

RECIPITATORS

RECIPITATORS

3E

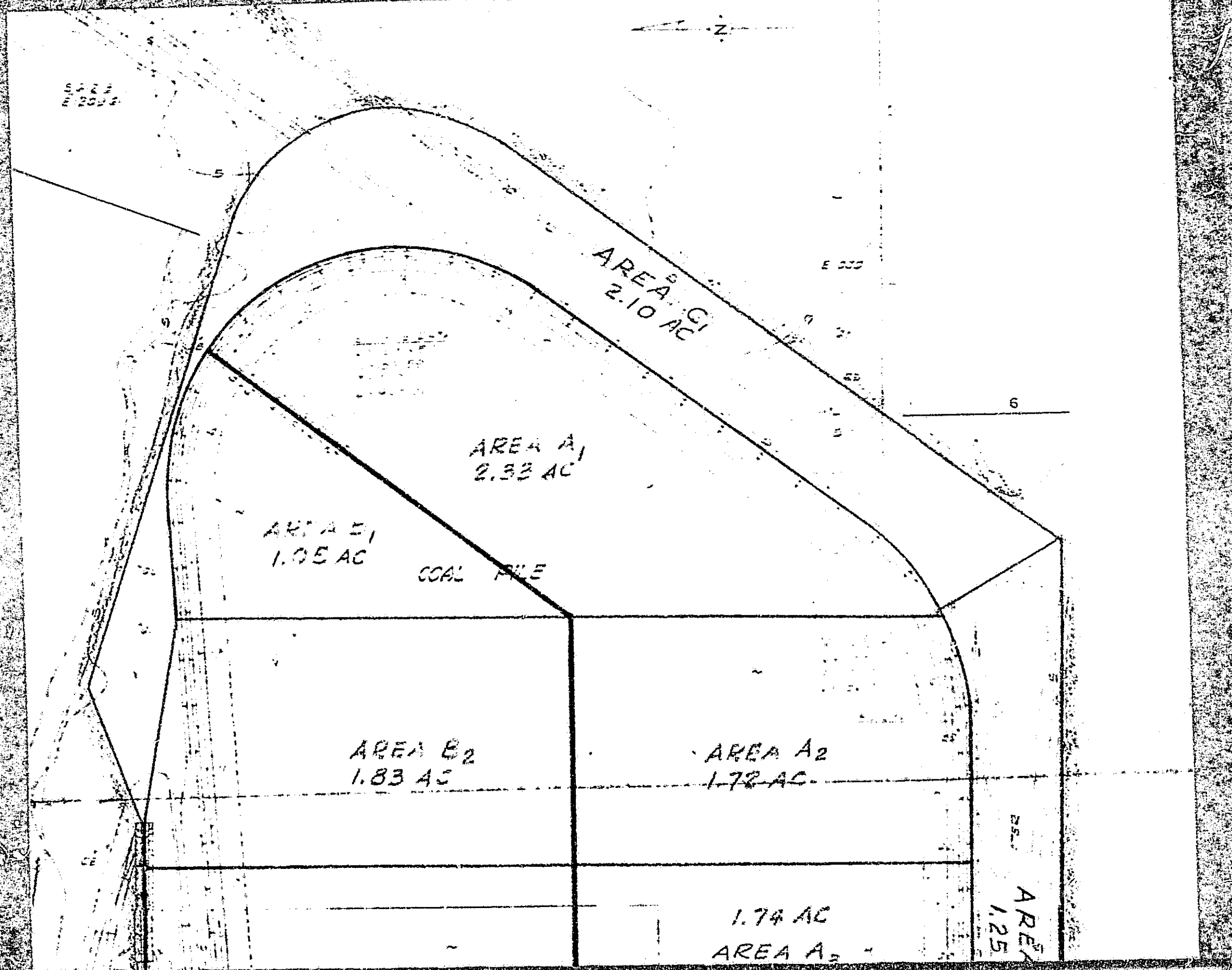
YARD AREA 9.6 AC.

EXISTING BRIDGE

CAR DUMPER

PROFILE

PROFILE



Electronic Filing: Received, Clerk's Office, 10/31/2022

AREA B4
1.83 AC

COAL FILE

1.74 AC
AREA A3
COAL FILE

AREA C2
1.25 AC

1.94 AC
AREA B5

1.31 AC
AREA B6

AREA A4
.97 AC

TOTAL
20.00 AC

AREA C3
2.30 AC

COAL EQUIPMENT

STORAGE BUILDING

BASIN AREA
1.33 AC

270'

180'

GRAND
TOTAL
21.33 AC

Electronic Filing: Received, Clerk's Office 10/31/2022

Electronic Filing: Received, Clerk's Office 10/31/2022

STATE OF ILLINOIS

ENVIRONMENTAL PROTECTION AGENCY

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Signed: Leon C. Baker

ADM-1041A REV. (4/77)

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VALVE SYMBOLS

NORMALLY OPEN DURING SYSTEM OPERATION	NORMALLY CLOSED DURING SYSTEM OPERATION	VALVE TYPE
L.O.	L.C.	GATE (LOCKED OPEN OR CLOSED)
		GLOBE
	N.C.	STOP CHECK
		BALL
		PLUG
	N.C.	BUTTERFLY
		ANGLE
		ANGLE STOP CHECK
		DIAPHRAGM
		NEEDLE
		PINCH
		KNIFE GATE

VALVE TYPE

- FOOT
- CHECK
- EXCESS FLOW CHECK
- SET @ ___ PSIG — ANGLE SAFETY OR RELIEF
- SET @ ___ PSIG — POWER SAFETY OR RELIEF
- SET @ ___ PSIG — STRAIGHT SAFETY OR RELIEF
- QUICK OPENING GATE (TYPICAL FOR OTHER TYPES)
- MANUAL FLOW CONTROL
- SET @ ___ PSIG — SELF CONTAINED PRV
- SET @ ___ PSIG — SELF CONTAINED BACK PRESSURE REGULATOR
- HOSE GATE VALVE (TYPICAL FOR OTHER TYPES)
- COMMON PORT — CLOSED PORT IN ALT. MODE — THREE-WAY — CLOSED PORT
- COMMON PORTS — PLUG IF DESIRED — FOUR-WAY
- ROTARY FEED

PIPE LINE SYMBOLS

- PRIMARY SERVICE - NEW
- PRIMARY SERVICE - EXISTING
- SECONDARY SERVICE - NEW
- SECONDARY SERVICE - EXISTING
- TERTIARY SERVICE - NEW
- TERTIARY SERVICE - EXISTING
- E — ELECTRICALLY TRACED & INSULATED
- S — STEAM TRACED & INSULATED
- INSULATED ONLY
- FUTURE EQUIPMENT OR PIPING

PIPE LINE COMPONENT SYMBOLS

- END CLOSURE - WELDED CAP
- END CLOSURE - SCREWED CAP
- END CLOSURE - BLIND FLANGE
- END CLOSURE - HOSE CONNECTION
- REDUCER
- QUICK DISCONNECT
- SPECTACLE BLIND - LINE OPEN
- IF — INSULATING FLANGE SET
- OPEN FUNNEL DRAIN
- CLOSED FUNNEL DRAIN
- FLOOR DRAIN
- ATMOSPHERIC VENT - WITH SCREEN
- FLUME
- RELIEF VALVE VENT PIPE SLIP JOINT
- ROOF EXHAUST HOOD
- PU/A — PURGE (AIR, NITROGEN ETC.)
- STATIC MIXER
- MIXING TEE
- SILENCER
- PITOT TUBE
- ROTAMETER
- AIR BLOWER

PIPE LINE COMPONENT SYMBOLS

- T — STEAM TRAP
- A — AIR RELEASE VALVE
- Y-TYPE STRAINER
- TEMPORARY STRAINER
- SINGLE BASKET STRAINER
- DUPLEX BASKET STRAINER
- RESTRICTION DEVICE (SINGLE OR MULTI-STAGE)
- CAP — RESTRICTION DEVICE (CAPILLIARY)
- EXPANSION JOINT
- FLEXIBLE HOSE
- FA — FLAME ARRESTOR
- SIGHT FLOW INDICATOR
- FILTER
- SPRAY NOZZLES
- SPARGER
- INJECTOR / EJECTOR
- BURST @ ___ PSIG — RUPTURE DIAPHRAGM (DISC)
- HEATING COIL (STEAM OR ELECTRIC)
- SPRAY WATER NOZZLE
- MAGNETIC FLOW METER
- FLOW NOZZLE OR VENTURI
- M — PROGRESSIVE CAVITY PUMP
- FLOW ORIFICE
- TURBINE METER
- SUBMERSIBLE PUMP
- VACUUM PUMP
- CENTRIFUGAL PUMP
- RECIPROCATING POSITIVE DISPLACEMENT PUMP
- DIAPHRAGM PUMP
- ROTARY POSITIVE DISPLACEMENT PUMP
- M — CENTRIFUGAL SUMP PUMP

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BRUNING A4-131 28010

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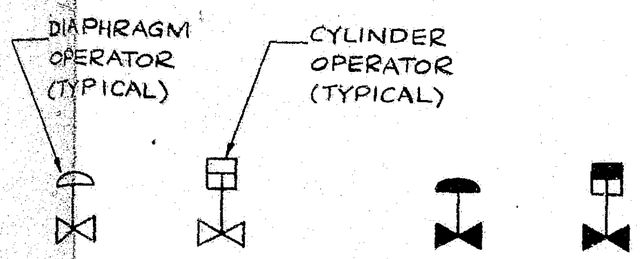
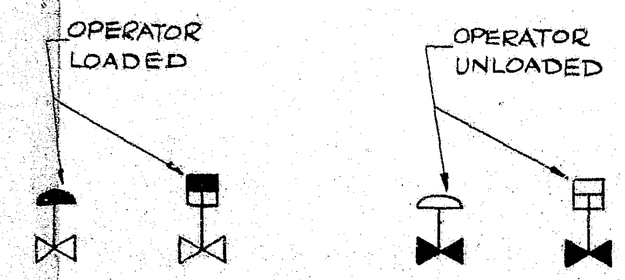
OPERATOR SYMBOLS

DIAPHRAGM & CYLINDER OPERATORS (SPRING RETURN) FOR CONTROL & ON/OFF VALVES



AIR TO CLOSE (i.e. FAIL OPEN)

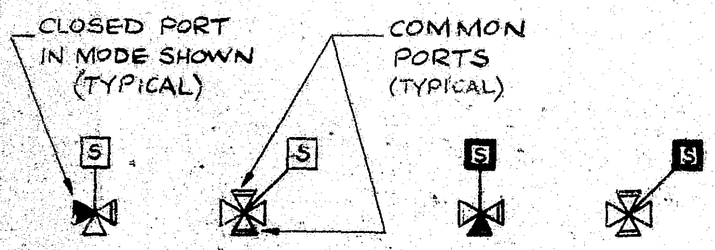


AIR TO OPEN (i.e. FAIL CLOSED)

SOLENOID OPERATORS (SPRING RETURN) FOR VALVES

ENERGIZE TO CLOSE FAIL OPEN

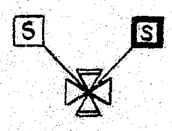
ENERGIZE TO OPEN FAIL CLOSED



DE-ENERGIZED

ENERGIZED

DOUBLE ACTING SOLENOID & CYLINDER OPERATORS

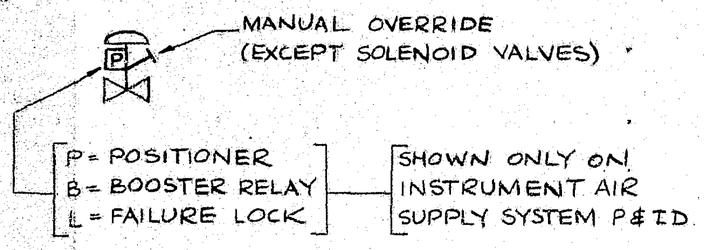


FOUR WAY SOLENOID VALVE DOUBLE ACTING

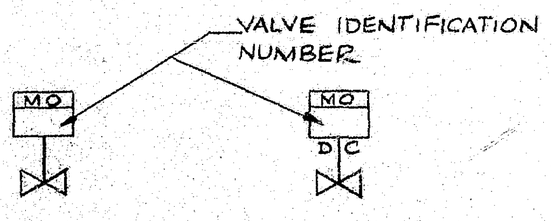
CYLINDER OPERATOR DOUBLE ACTING (AIR TO OPEN & AIR TO CLOSE)

OPERATOR ACCESSORIES

(TYPICAL FOR ALL TYPES OF OPERATORS & VALVES EXCEPT AS NOTED)



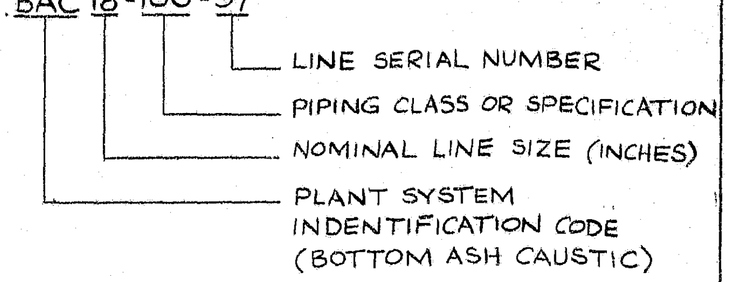
MOTOR OPERATORS (WITH MANUAL OVERRIDE)

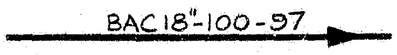


AC MOTOR

DC MOTOR

PIPE LINE NUMBERING





EXAMPLE P&ID ENTRY

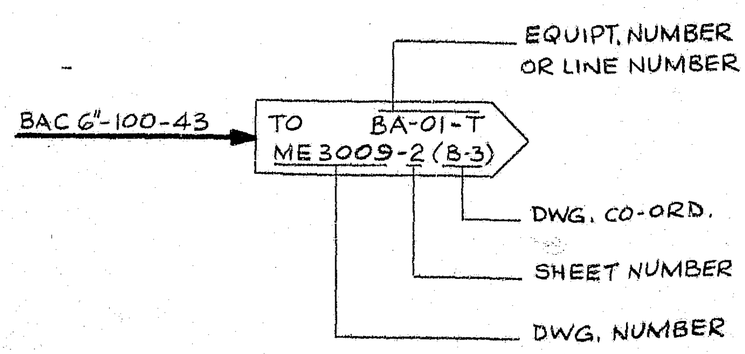
PLANT SYSTEM IDENTIFICATION CODES

CODE		SYSTEM DESCRIPTION
AH	–	ASH HANDLING SYSTEMS – COMBINATIONS OF BOTTOM ASH, ECONOMISER ASH, PRECIPITATOR ASH, BOTTOM SLAG.
BA	–	BOTTOM ASH OR SLAG
CR	–	COAL PILE RUN-OFF
DW	–	DEMINERALIZER WASTES
EA	–	ECONOMISER ASH
FA	–	FLY ASH
FD	–	FLOOR DRAINS
HQ'	–	HIGH QUALITY WATER WASTES – BOILER BLOWDOWN OR BOILER DRAINS.
MC	–	METAL CLEANING WASTES
PA	–	PRECIPITATOR ASH
RY	–	ROOF OR YARD RUN-OFF
SP	–	SPILL WASTES – OIL OR HAZARDOUS MATERIALS.

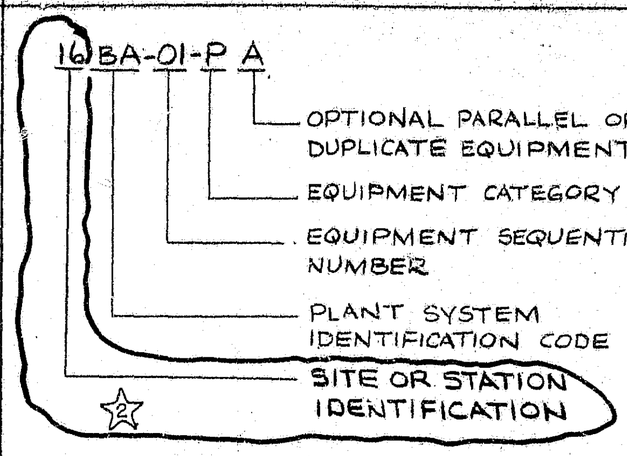
CODE		MATERIAL DESCRIPTION
A	–	ACID
C	–	CAUSTIC OR ALKALI
D	–	SLUDGE
E	–	TREATED EFFLUENT
F	–	FILTERED WATER
G	–	COAGULANTS
I	–	AIR
K	–	ASKARAL OR PCB TYPE
L	–	SOLIDS - DRY
N	–	NEUTRAL NON-SOLIDS BEARING RAW WASTES.
O	–	OIL OR OIL TYPE
P	–	POLYMER OR COAGULANT AIDS
R	–	REGENERATION
S	–	SOLIDS BEARING WATER - SLUICE OR SLURRIES
T	–	STEAM
W	–	RAW WATER

e.g. BAD = BOTTOM ASH SLUDGE

CONTINUATIONS



EQUIPMENT NUMBERING



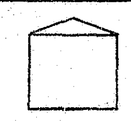
EQUIPMENT CATEGORIES

A – EXCHANGERS, CONDENSERS, COOLING TOWERS.
B – BOILERS, STEAM GENERATORS, AUXILIARY BOILERS.
C – COMPRESSORS, BLOWERS, VACUUM PUMPS, FANS, REFRIGERATION UNITS, INCLUDING DRIVERS;
D – DEMINERALIZERS, ABSORBERS, ADSORBERS, CLARIFIERS, AIR DRYERS, EVAPORATORS, SEPARATORS; (2)
E – ELECTRICAL EQUIP., SWITCHGEAR, MOTOR CONTROL CENTERS, TRANSFORMERS.
F – FILTERS, STRAINERS, TRAVELLING SCREENS, RAKES, COLD TRAPS, PRECIPITATORS, PURIFIERS, DUST COLLECTORS, CENTRIFUGES, SKIMMERS. (2)
G – FUEL HANDLING EQUIP., CRANES, HOISTS, BALERS INCLUDING MOTORS.
H – PIPE SUPPORTING ELEMENTS INCLUDING HANGERS, SUPPORTS, SNUBBERS, RESTRAINTS
J – INSTRUMENT CNTRL. BOARDS, PANELS, CABINETS
K – TURBINES, TURBINE-GENERATORS, DIESEL-GENERATORS, DIESEL ENGINES, FLUID DRIVES, GEAR REDUCERS
L – AGITATORS, EDUCTORS, STATIC MIXERS
M – PIPING SPECIALTIES-TRAPS, HOSES, EXPANSION JOINTS, RESTRICTION ORIFICES, ETC.
N – SUMPS, PONDS, BASINS (2)
P – PUMPS INCLUDING DRIVERS
Q – DIMINERALIZERS
R – REACTOR & REACTOR CONTROL DEVICES
S – SPECIAL PACKAGED ITEMS OR SYSTEMS
T – TANKS
X – MISCELLANEOUS AIR HANDLING DEVICES & SPARGERS
Y – DAMPERS

STATION IDENTIFICATION

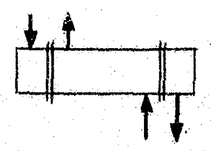
3	POWERTON
7	STATELINE
9	JOLIET (2)
16	WAUKEGAN

MISCELLANEOUS EQUIPMENT SYMBOLS

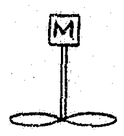


VERTICAL TANK

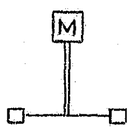
HORIZONTAL TANK



HEAT EXCHANGER



IMPELLER TYPE AGITATOR



TURBINE TYPE AGITATOR

REVISIONS	
REV.	DESCRIPTION
A	ISSUED FOR INITIAL REVIEW G. Boyden
B	ISSUED FOR PROJECT REVIEW P.G. White 11/16/76
C	ISSUED FOR CLIENT REVIEW 11/17/76 COG. ENGR. J.R. Hawkins PROJ. ENGR. P.G. White
D	VARIOUS SYMBOLS ADDED P.G. White 12-2-76 COG. ENG. J.R. Hawkins PROJ. ENG. P.G. White
1	ISSUED APPROVED FOR CONSTRUCTION P.G. White 12-6-76
2	REVISED EQUIP. NUMBERING & ADDED FOOT VALVE. 2-16-77 DRAWN G. Boyden I&C ENGR. COG. ENGR. PROJ. ENGR.

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DRAWING STATUS: APPROVED FOR CONSTRUCTION

Date 12-6-76

DRAWN	P.G. White	11/2/76
CHECKED	P.G.W.	11/16/76
COG. ENGINEER	J.R. Hawkins	12/6/76
DISCIP. MGR. APP.	P.G. White	12/6/76
APPROVAL		
APPROVAL		
APPROVAL, PROJ.	P.G. White	12/6/76
APPROVAL, CLIENT		

COMMONWEALTH EDISON COMPANY
WASTE WATER TREATMENT FACILITIES-ALL STNS.

PIPING & INSTRUMENT DIAGRAM STANDARDS

CECO CONTRACT | CECO DWG NO. | REV.

NUS CORPORATION, ROCKVILLE, MD. | DRAWING NO. C-M2000 | REV. 2

SCALE: NONE | SHEET 1 OF 2

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STATE OF ILLINOIS

ENVIRONMENTAL PROTECTION AGENCY

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Signed: Leon C. Baker

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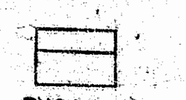
INSTRUMENT & CONTROL DEVICE SYMBOLS



MAIN CONTROL ROOM PANEL MOUNTED DEVICE

PMOIJ — PANEL NUMBER (TYPICAL)

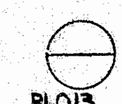
AUXILIARY CONTROL EQUIPMENT ROOM AND COMPUTER CABINET MOUNTED DEVICES

PAOIJ — PANEL NUMBER (TYPICAL)

LOCALLY MOUNTED DEVICE NOT ON INSTRUMENT PANEL OR ASSEMBLY

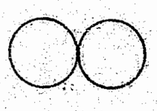
SP=100 PSIG — SET POINT DATA (TYPICAL)

DESIGNATES INSTRUMENT IS FURNISHED WITH ASSOCIATED EQUIPMENT



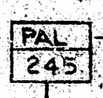
LOCAL INSTRUMENT PANEL MOUNTED DEVICE

PLOI3 — PANEL NUMBER (TYPICAL)



MULTIPLE DEVICES IN ONE ASSEMBLY (e.g. TEMPERATURE ELEMENT IN THERMOWELL)

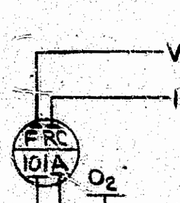
ANNUNCIATOR ALARM IDENTIFICATION NUMBER



ALARM DESCRIPTION IN ACCORDANCE WITH THE INSTRUMENT TYPE CODES

ANNUNCIATOR SYSTEM ALARM IDENTIFICATION NUMBER

INSTRUMENT & CONTROL DEVICE NUMBERS



VARIABLE (MEASURED OR INITIATING) — INSTRUMENT TYPE CODES

INSTRUMENT FUNCTION — INSTRUMENT TYPE CODES

CLARIFYING SYMBOLS (IF REQUIRED) PER THE CLARIFYING SYMBOL LIST

LETTER SUFFIX WHEN REQUIRED TO IDENTIFY ADDITIONAL DEVICES IN SAME LOOP THAT PERFORM THE SAME FUNCTION.

LOOP SYSTEM NUMBER

CLARIFYING SYMBOL LIST

A	ANALOG SIGNAL	LP	LOW PASS
ADD	ADD	MAX	MAXIMUM
AVG	AVERAGE	MIN	MINIMUM
BI	BIAS	N_2	NITROGEN
CO_2	CARBON DIOXIDE	NA	SODIUM
D	DIGITAL	NAK	SODIUM POTASSIUM
DIFF	SUBTRACT	N_2H_4	HYDRAZINE
DIR	DIRECT ACTING	O_2	OXYGEN
FC	FAIL CLOSED	pH	pH ANALYSIS
FI	FAIL INTERMEDIATE	RES	RESET
FL	FAIL LOCKED	REV	REVERSE ACTING
FO	FAIL OPEN	SI	SILICA
H_2	HYDROGEN	SM	SMOKE OR IONIZATION
HE	HELIUM	SP	SET POINT
HL	HIGH LIMIT	SQ. RT	SQUARE ROOT
HP	HIGH PASS	TURB	TURBIDITY
LL	LOW LIMIT	X	MULTIPLY
		I/P	CURRENT TO PNEUMATIC
		P/I	PNEUMATIC TO CURRENT

INSTRUMENT TYPE CODES

FIRST LETTER VARIABLE (MEASURED OR INITIATING)	SECOND OR SUCCEEDING LETTERS INSTRUMENT FUNCTION	
A	ANALYSIS	A ALARM
B	BURNER FLAME	AC ALARM CLOSED
C	CONDUCTIVITY	AH ALARM HIGH
D	DENSITY	AL ALARM LOW
E	VOLTAGE	AO ALARM OPEN
F	FLOW	C CONTROLLER (BLIND)
H	HAND (MANUAL)	CK CONTROLLER & HAND/AUTO
I	CURRENT (ELEC)	DA DIFFERENTIAL ALARM
J	POWER (ELEC)	DC DIFFERENTIAL CONTROLLER
K	TIME	DI DIFFERENTIAL INDICATOR
L	LEVEL (LIQUID OR SOLID)	DK DIFFERENTIAL CONTROL STATION
M	MOISTURE (HUMIDITY)	DR DIFFERENTIAL RECORDER
N	NEUTRON FLUX	DS DIFFERENTIAL SWITCH
P	PRESSURE OR VACUUM	DT DIFFERENTIAL TRANSMITTER
R	RADIOACTIVITY	DY DIFFERENTIAL RELAY
S	SPEED OR FREQUENCY	E PRIMARY ELEMENT
T	TEMPERATURE	EW PRIMARY ELEMENT WELL
U	MULTIVARIABLE	G GLASS
V	VIBRATION	I INDICATOR
W	WEIGHT	IC INDICATING CONTROLLER
X	SPECIAL (REFER TO CLARIFYING SYMBOL)	IR INDICATING RECORDER
Y	STRAIN	IS INDICATING SWITCH
Z	POSITION	IT INDICATING TRANSMITTER
		IY INDICATING RELAY
		JR MULTIPOINT RECORDER
		K CONTROL STATION - VARIABLE TYPE (HAND/HAND-AUTO) WITHOUT CONTROLLER
		L LIGHT (PILOT)
		Q INTEGRATOR
		R RECORDER CONTINUOUS PEN
		RC RECORDER CONTROLLER
		S SWITCH
		SC SWITCH - CLOSED DEVICE POSITION
		SH SWITCH HIGH
		SI SWITCH - INTERMEDIATE DEVICE POSITION
		SL SWITCH LOW
		SO SWITCH - OPEN DEVICE POSITION
		SV SOLENOID VALVE (IN CONTROL LOOPS ONLY)
		T TRANSMITTER
		U MULTIFUNCTION
		W WELL
		X SPECIAL (REFER TO CLARIFYING SYMBOL LIST)
		Y RELAY - SIGNAL CONVERTER, COMPUTING, ETC
		Z POWER POSITIONER/CONTROL DRIVE (EXCEPT VALVE MOUNTED)
		CV CONTROL VALVE
		GB GAUGE BOARD
		RV REGULATING VALVE
		SV SAFETY VALVE (RELIEF VALVE)

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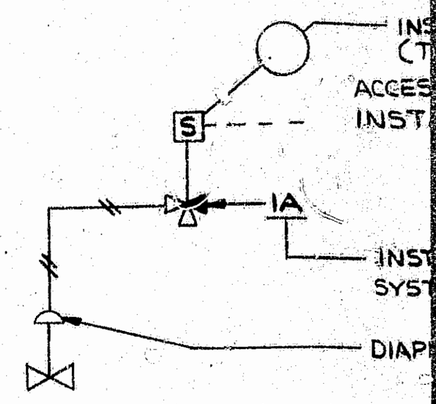
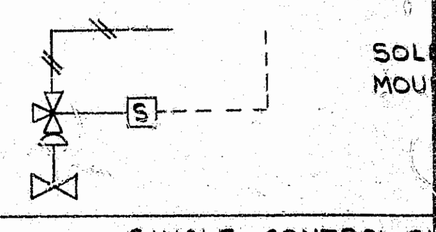
TYPICAL INSTRUMENT & CONTR

MULTIPLE CONTROL S
FOR PNEUMATIC OPE

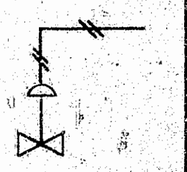
(FOR SIGNAL ACCESSORIE
ON OPERATOR REFER TO
SHEET, DAMPER SPECIFICAT
AIR SUPPLY P&ID)



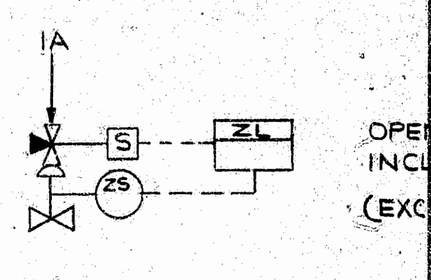


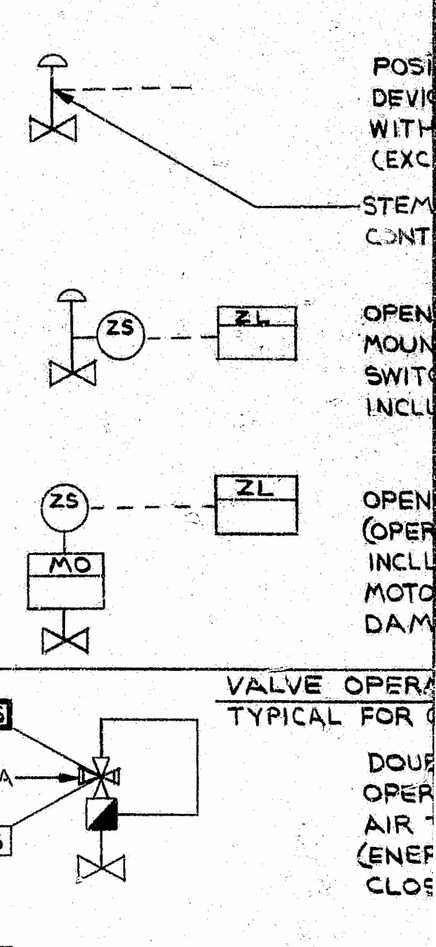
SINGLE CONTROL SI
FOR PNEUMATIC OPER

(FOR SIGNAL ACCESSORIES
ON OPERATOR REFER TO
SHEET, DAMPER SPECIFICA
AIR SUPPLY P&ID.)

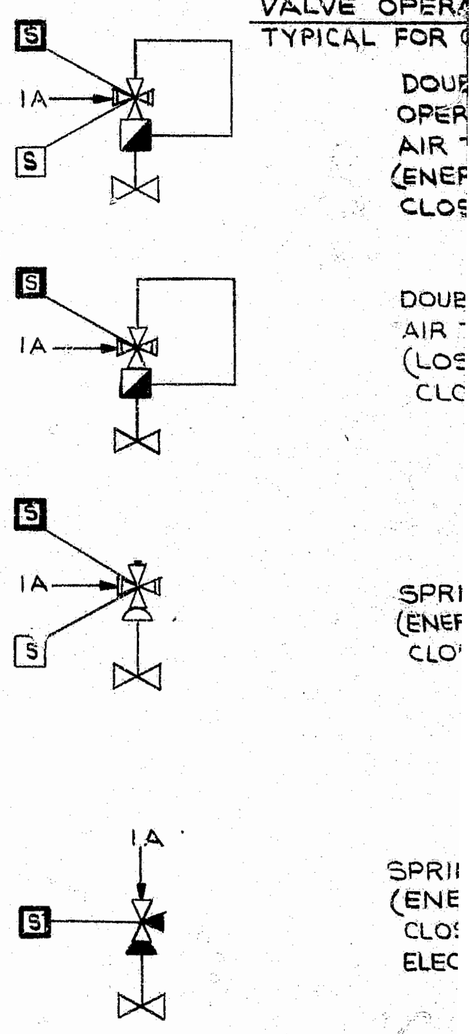


VALVE/DAMPER POSIT





VALVE OPERA
TYPICAL FOR



BRUNING 44-131 28010

Electronic Filing: Received, Clerk's Office 10/31/2022

NT & CONTROL SYMBOLING EXAMPLES

E CONTROL SIGNALS EUMATIC OPERATORS

ACCESSORIES FURNISHED MOUNTED
R REFER TO CONTROL VALVE DATA
R SPECIFICATION AND/OR INSTRUMENT
P&ID)

INSTRUMENT IDENTIFICATION NO. (TYPICAL)

ACCESSORIES FURNISHED AND/OR INSTALLED BY P.C.

IA

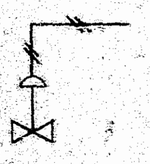
INSTRUMENT AIR SUPPLY SYSTEM CODE (TYPICAL)

DIAPHRAM OPERATOR (TYPICAL)

SOLENOID VALVE FURNISHED MOUNTED WITH OPERATOR

CONTROL SIGNAL EUMATIC OPERATORS

ACCESSORIES FURNISHED MOUNTED
REFER TO CONTROL VALVE DATA
ER SPECIFICATION AND/OR INSTRUMENT
P&ID.)



AMPER POSITION SIGNALS

OPEN & CLOSED POSITION LIGHTS INCLUDED WITH HAND SWITCH (EXCEPT MO TYPE)

POSITION FROM STEM-MOUNTED DEVICES FURNISHED INTEGRAL WITH VALVE/DAMPER (EXCEPT MO TYPE)

STEM MTD POSITION DEVICE PER CONTROL VALVE/DAMPER DATA SHEET

OPEN & CLOSED POSITION LIGHTS, MOUNTED REMOTE FROM HAND SWITCH OR NO HAND SWITCH INCLUDED.

OPEN & CLOSED POSITION LIGHTS (OPERATED FROM MOTOR GEAR TRAIN) INCLUDED WITH HAND SWITCH FOR MOTOR-OPERATED VALVES AND DAMPERS.

ALVE OPERATOR CONTROLS YPICAL FOR OTHER CONTROL DEVICES

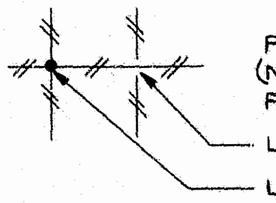
DOUBLE ACTING CYLINDER OPERATOR
AIR TO OPEN & AIR TO CLOSE (ENERGIZE TO OPEN - ENERGIZE TO CLOSE) FAILS IN LAST POSITION

DOUBLE ACTING CYLINDER OPERATOR
AIR TO OPEN & AIR TO CLOSE (LOSS OF ELECTRICAL POWER CLOSES VALVE)

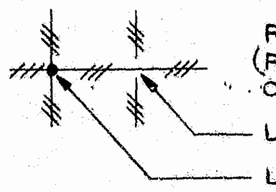
SPRING - RETURN OPERATOR (ENERGIZE TO OPEN & ENERGIZE TO CLOSE)

SPRING - RETURN OPERATOR (ENERGIZE TO OPEN & DE-ENERGIZE TO CLOSE - VALVE CLOSES ON ELECTRICAL OR AIR FAILURE)

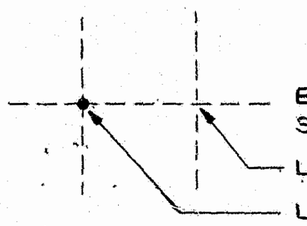
INSTRUMENT & CONTROL SIGNAL SYMBOLS



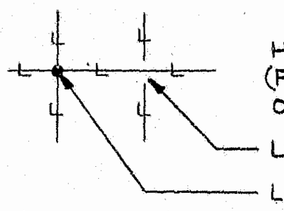
PNEUMATIC ANALOG SIGNAL LINE (NOT INSTRUMENT AIR SUPPLY - FURN. & INSTALLED BY PC)
LINES NOT CONNECTED
LINES CONNECTED



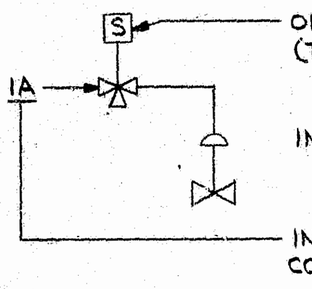
PNEUMATIC ANALOG SIGNAL LINE (FURN. & INST. BY OTHERS UNLESS OTHERWISE NOTED)
LINES NOT CONNECTED
LINES CONNECTED



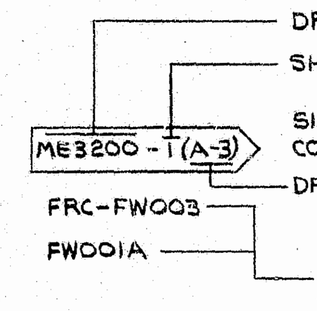
ELECTRICAL ANALOG OR DIGITAL SIGNAL
LINES NOT CONNECTED
LINES CONNECTED



HYDRAULIC SIGNAL LINE (FURN. & INST. BY OTHERS UNLESS OTHERWISE NOTED)
LINES NOT CONNECTED
LINES CONNECTED

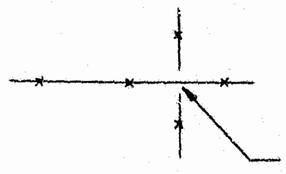


ON-OFF CONTROLLING DEVICE (TYPICAL)
INSTRUMENT AIR SUPPLY SIGNAL
INSTRUMENT AIR SUPPLY SYSTEM CODE (TYPICAL)

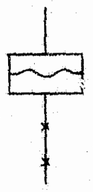


DRAWING NUMBER
SHEET NUMBER
SIGNAL LINE ARROWHEAD WHEN CONTINUED ON ANOTHER P&ID
DRAWING CO-ORDINATES
DEVICES SIGNAL LINE CONNECTS TO ON REFERENCED P&ID

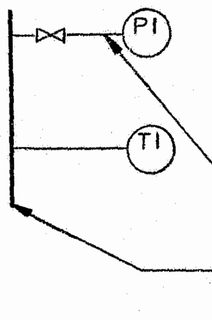
INSTRUMENT SENSING PIPELINE SYMBOLS



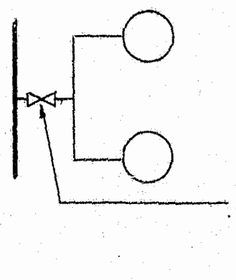
CAPILLARY TUBING (FILLED SYSTEM)
LINES NOT CONNECTED



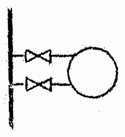
FILLED INSTRUMENT SENSING LINE



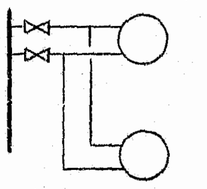
PROCESS - CONNECTED SENSING LINE FOR SINGLE INSTRUMENT
VALVE & PIPING DETAILS PER INSTRUMENT INSTALLATION DETAILS (TYPICAL)
PROCESS PIPE OR VESSEL (TYPICAL)



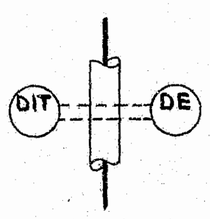
PROCESS - CONNECTED SENSING LINE COMMON TO MULTIPLE INSTRUMENTS
MAIN LINE SHUTOFF (ROOT) VALVE COMMON UNLESS SHOWN OTHERWISE (TYPICAL)



MULTIPLE PROCESS - CONNECTED SENSING LINES TO SINGLE INSTRUMENT



MULTIPLE PROCESS - CONNECTED SENSING PIPELINES TO MULTIPLE INSTRUMENTS



DENSITY INDICATOR

REVISIONS	
REV.	DESCRIPTION
A	ISSUED FOR INITIAL REVIEW G. Bogden
B	ISSUED FOR PROJECT REVIEW P.G. White 11/16/76
C	ISSUED FOR CLIENT REVIEW 11/17/76 COG. ENGR. PROJ. ENGR.
D	VARIOUS SYMBOLS & CODES ADDED G. BOGDEN 12-2-76 COG. ENG. PROJ. ENG.
1	ISSUED APPROVED FOR CONSTRUCTION P.G.W. 12-6-76

04960000175

DRAWING STATUS

APPROVED FOR CONSTRUCTION

Date 12-6-76

DRAWN	G Bogden	11/5/76
CHECKED	P G White	11/14/76
COG. ENGINEER		12/1/76
DISCIP. MGR. APPVL.		12/1/76
APPROVAL,		
APPROVAL,		
APPROVAL, PROJ.		12/6/76
APPROVAL, CLIENT		

COMMONWEALTH EDISON COMPANY
WASTE WATER TREATMENT FACILITIES-ALL STNS.

PIPING & INSTRUMENT DIAGRAM STANDARDS

CECO CONTRACT

CECO DWG. NO.

REV.

NUS CORPORATION
ROCKVILLE, MD.

DRAWING NO. C-M2000

REV. 1

SCALE: NONE

SHEET 2 OF 2

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STATE OF ILLINOIS

ENVIRONMENTAL PROTECTION AGENCY

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Signed: Leon C. Baker

ADM-1041A REV. (4/77)

0496000076

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Electronic Filing: Received, Clerk's Office 10/31/2022

REV. C

DWG. NO. C-M2501

POLYMER FEED HOPPER

16BA-100-S
16MC-101-S {CAP.: 3 FT.^{3}
16CR-102-S {CAP.: 1.25 FT.^{3}
16CR-105-S {CAP.: 1.25 FT.^{3}
16CR-106-S {CAP.: 1.25 FT.^{3}

MAT'L. S.S.

POLYMER MIXING TANK

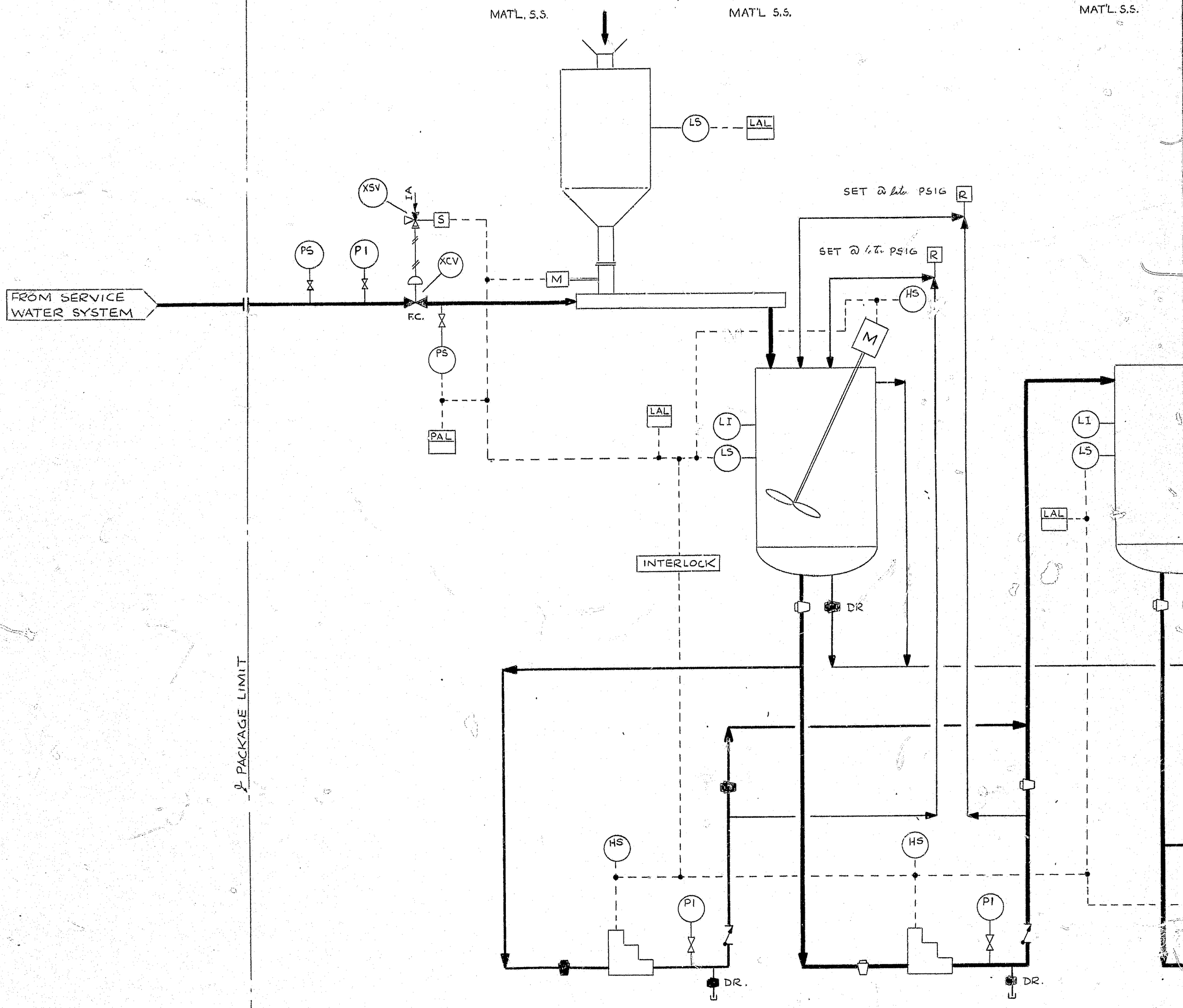
16BA-100-S
16MC-101-S {CAP. 2000 GAL.
16CR-102-S {CAP.: 400 GAL.
16CR-105-S {CAP.: 400 GAL.
16CR-106-S {CAP.: 200 GAL.

MAT'L S.S.

POLYMER FEE

16BA-100-S-
16BA-100-S- {CAP.:
16CR-102-S- {CAP.:
16CR-105-S- {CAP.
16CR-106-S- {CAP.:

MAT'L. S.S.



POLYMER TRANSFER PUMPS

16BA-100-S
16BA-101-S. {CAP.: 40 GPM @ 100 PSI
16CR-102-S {CAP.: 17 GPM @ 100 PSI
16CR-105-S {CAP. 17 GPM @ 100 PSI
16CR-106-S CAP. 17 GPM @ 100 PSI

MAT'L. S.S.

POLYMER MIXING TK. MIXER

16BA-100-S
16BA-101-S {CAP.: 420 R.P.M., 1 ½ H.P.
16CR-102-S {CAP.: 420 R.P.M. ¾ H.P.
16CR-105-S CAP. 420 R.P.M. ¾ H.P.
16CR-106-S CAP. 420 R.P.M. ¾ H.P.

MAT'L. S.S.

04960000177

BRUNING 44-131 28010

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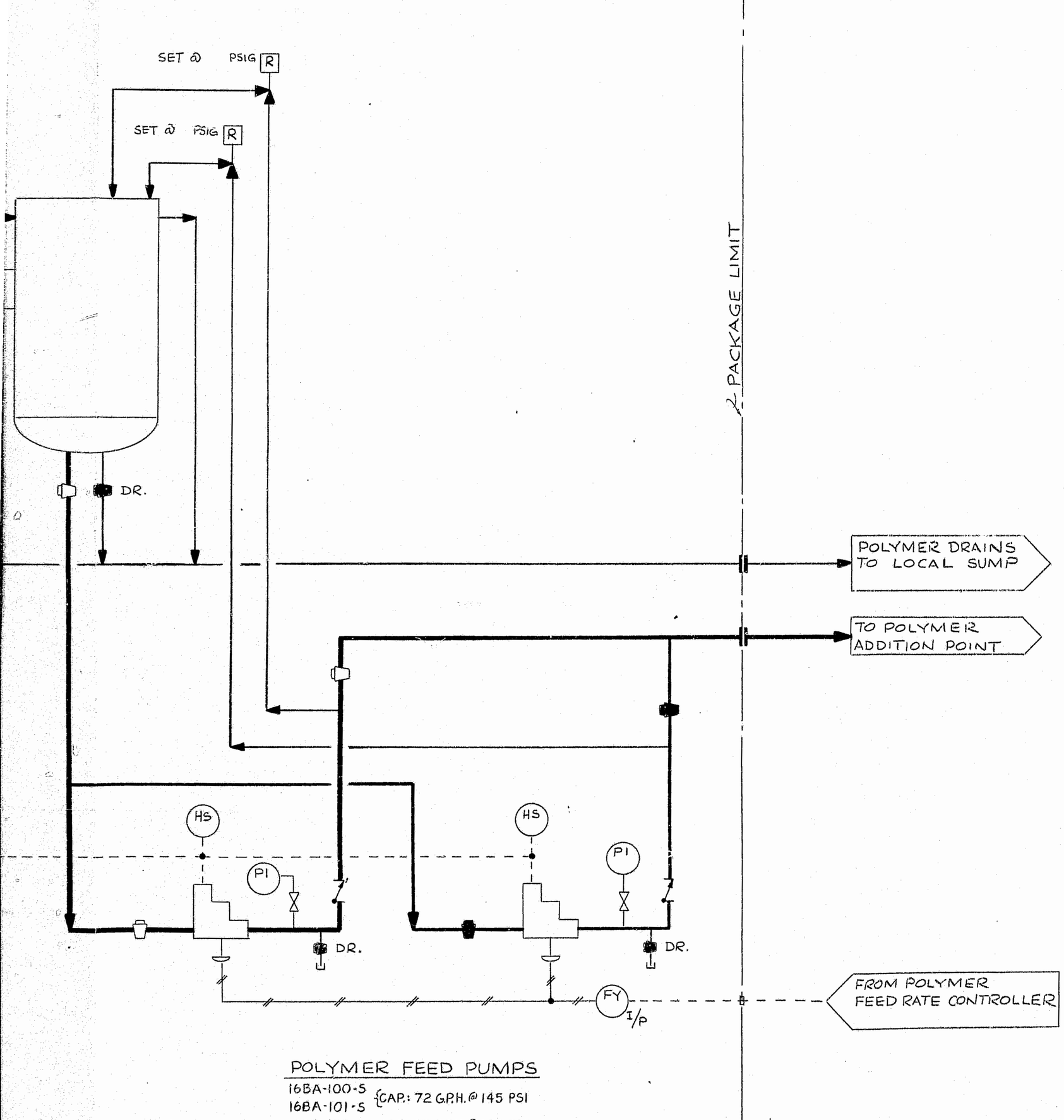
PARTS LIST						
REF	ITEM	DESCRIPTION	REQ'D		IDENTIFICATION	
					MATERIAL	PART NO. OR SPECIFICATION

REVISIONS	
REV.	DESCRIPTION
A	ISSUED FOR INITIAL REVIEW 12, 01 to 12-17-76
B	ISSUED FOR PROJECT REVIEW T R King 1-21-77
C	ISSUED FOR CLIENT CONCEPT REVIEW 2-15-77 SYS. ENGR. J R Wilson I & C. ENGR. [illegible] COG. ENGR. J R Wilson P.E. [illegible]

YMEK FEED TANK
100-S-
100-S- {CAP: 2,000 GAL.
102-S- {CAP: 400 GAL.
105-S- {CAP: 400 GAL.
106-S- {CAP: 200 GAL.

L. S.S.



POLYMER FEED PUMPS
16BA-100-S
16BA-101-S {CAP.: 72 G.P.H. @ 145 PSI
16CR-102-S CAP.: 60 G.P.H. @ 100 PSI
16CR-105-S CAP.: 60 G.P.H @ 75 PSI
16CR-106-S CAP.: 60 G.P.H @ 75 PSI

MAT'L. S.S.

04960000178

DRAWING STATUS

PRELIMINARY

	Date
DRAWN R G White	12/9/76
CHECKED T. R. King	1/21/77
COG. ENGINEER	
DISCIP. MGR. APPVL.	
APPROVAL,	
APPROVAL,	
APPROVAL, PROJ.	
APPROVAL, CLIENT	

COMMONWEALTH EDISON COMPANY
WASTE WATER TREATMENT FACILITIES - ALL STNS

POLYMER FEED SYSTEM
PIPING & INSTRUMENT DIAGRAM

NUS CORPORATION
ROCKVILLE, MD.

DRAWING NO. C-M2001 REV. C
SCALE: NONE SHEET 1 OF 1

Ele Filing: Received, Office 10/31/202

STATE OF ILLINOIS
ENVIRONMENTAL PROTECTION AGENCY

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Signed: Leon C. Baker

ADM-1041A REV. (4/77)

0456000179

Electronic Filing: Received, Clerk's Office 10/31/2022

DWG. NO. 5082ME3003 REV. E

FROM ASH SLUICE RETURN PUMPS DWG. ME3003-4 (E-4)

EXISTING PUMP SUCTIONS FROM DISCH TUNNELS

EXISTING PUMP SUCTIONS FROM DISCH TUNNELS

L.C.

L.C.

L.C.

L.C.

4A & 4B ASH SLUICE PUMPS

5A & 5B ASH SLUICE PUMPS

L.C.

L.C.

6A & 6B ASH SLUICE TANKS

TO UNIT 5 FLY ASH BACK UP HYDROVACTORS

TO ASH POND SH. 4 (E-7)

SERVICE WATER S&L DWG. M344

PUMP SEAL WATER

BOILER 17 SLAG TANKS

TO ECON. FLY ASH TANK DWG. ME 3021-1 (B-5)

UNIT 6 TURBINE OIL COOLERS S&L DWG M346

SERVICE WATER HEADER

LC

LC

NO. 1&2 ASH PUMPS

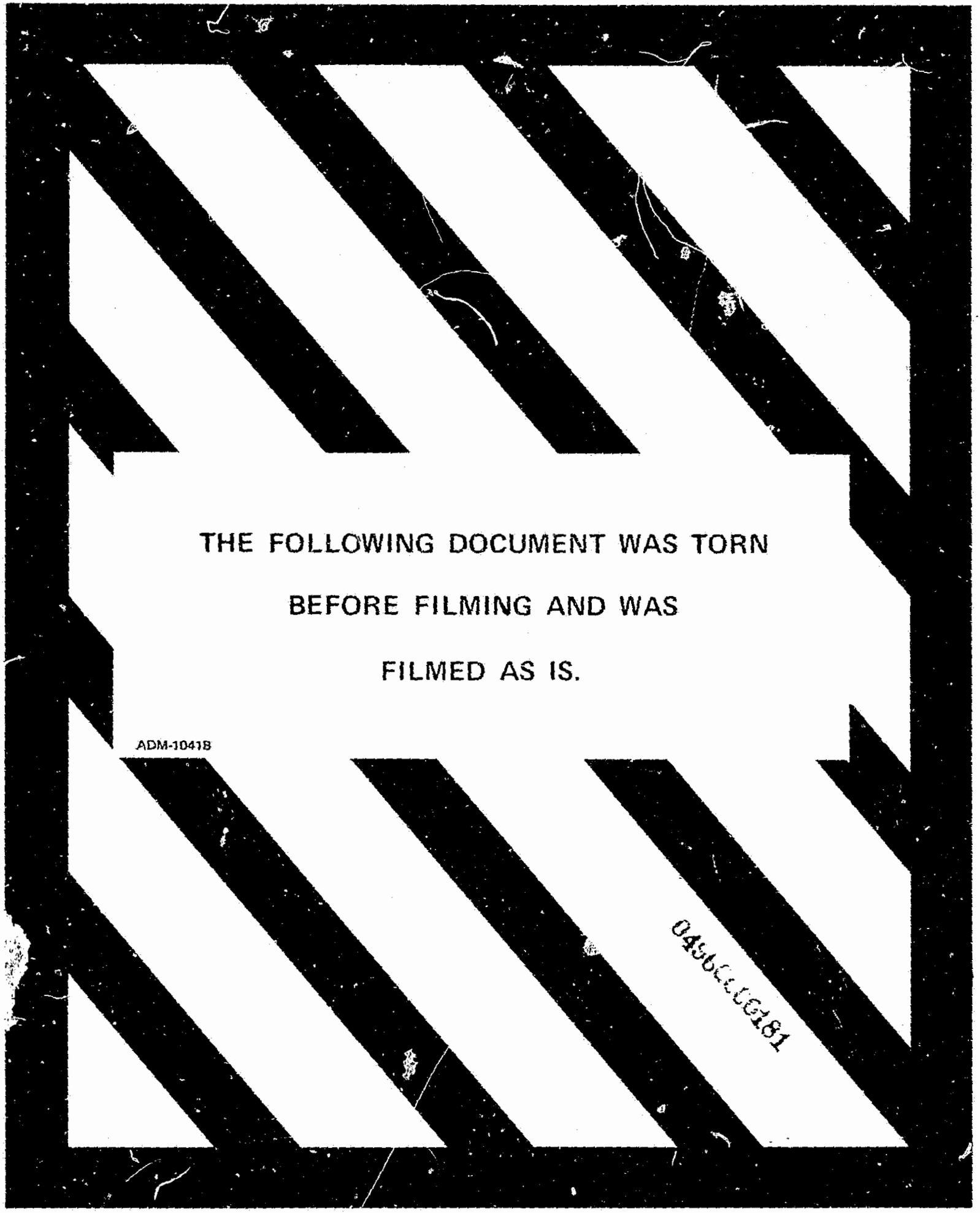
BOILERS 14, 15, 16 SLUICE SYSTEM

UNIT 5 ASH SLUICE PIT

04960000180

BRUNING 44-131 28010

Electronic Filing: Received, Clerk's Office 10/31/2022



Electronic Filing: Received, Clerk's Office: 10/31/2022

EQUIP. TAG NO.	STANDARD/SPECIFICATION NO.	MECH. ENGR. PURCHASING RECORD NO.

REVISIONS	
REV.	DESCRIPTION
A	INITIAL RELEASE
B	FOR REVIEW C.E.B 9/27/76 H.J. 9/27/76
C	ISSUED FOR CLIENT REVIEW OF DESIGN CONCEPT. COG. ENG. K.W. 10/1/76 SYS. ENG. J.B. P.E.
D	REMOVED UNIT 5&6 HD TK., UNIT 7&8 HD. TK. LEVEL CONTROL VALVE & MISC. REVS. 1-29-77
E	ADDED EQUIP. NOS., CAP. & MISC. REVISIONS 2-15-77 SYS. ENGR. I&C. ENGR. COG. ENGR. P.E.

UNIT 7&8 BOILERS S.M802(A-8)

TO KINGHOLE

UNIT 7&8 HEAD TANK

AH

AL

LO

IA

LS

SERVICE WATER MAKEUP S&L DWG. M800 (E-4)

HEAD TANK OVERFLOW TO MAIN COLLECTION TANK SH.4(D-7)

TO UNIT 8 ASH SLUICE PUMPS SHEET 2(C-4)

PI

PI

7A & 7B ASH SLUICE PUMPS

FC

IA

HA

TO UNIT 7 REHEAT FURNACE ASH HOPPER SHEET 2 (E-7)

7A & 7B ASH SLUICE PUMP GLANDS S&L DWG. M802 (A-8)

OVERFLOW

UNDER-FLOW

M

UNIT 7 REAR PASS HYDROVACTOR, S&L. DWG. M802 (C-8)

U/F & O/F TO MAIN COLLECTION TANK. ME3003-3(D-7)

UNDERFLOW

OVERFLOW

UNIT 5&6 DEWATERING BINS

NOTES:

1. ASH SLUICE PUMPS TO BE INTERLOCKED WITH ASH SLUICE RETURN PUMPS.
2. CONTROLS SHOULD BE PROVIDED TO ALARM ON LOW LEVEL IN HEAD TANK AND TRIP ASH SLUICE PUMPS ON LOW-LOW LEVEL.
3. ONE OF 7-A OR 7-B AND 8A OR 8B OVERFLOW PUMPS TO BE IN CONSTANT OPERATION, RECIRCULATING TO MIXING EDUCTORS. OTHER PUMP IN STANDBY. DISCHARGE VALVE OF OPERATING PUMP OPENS ON HIGH LEVEL, CLOSES ON LOW LEVEL. CONTROLS TO STOP OPERATING PUMP ON LOW-LOW LEVEL, START STANDBY PUMP ON HIGH-HIGH LEVEL. LCV FOR STANDBY PUMP TO BE IN CLOSED POSITION.
4. MAKE UP WATER AND HYDROGEN COOLER RETURN WATER ARE VALVED OUT OF UNIT 7 & 8 HEAD TANK DURING NORMAL RECYCLE OPERATION.

04960000182

DRAWING STATUS

PRELIMINARY

	Date
DRAWN O.R. STREAKER	8/2/76
CHECKED N. Gordon	9/27/76
COG. ENGINEER	
DISCIP. MGR. APPVL.	
APPROVAL,	
APPROVAL,	
APPROVAL, PROJ.	
APPROVAL, CLIENT	

COMMONWEALTH EDISON COMPANY
WASTE WATER TREATMENT FACILITIES-WAUKEGAN

BOTTOM ASH SLUICE SYSTEM
PIPING DIAGRAM

CLIENT CONTRACT 50-670 CLIENT DWG NO.

NUS CORPORATION ROCKVILLE, MD.

DRAWING NO. 5082M5

SCALE

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STATE OF ILLINOIS

ENVIRONMENTAL PROTECTION AGENCY

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Signed: Leon C. Baker

ADM-1041A REV. (4/77)

0436000183

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16BA-116-T
UNIT 7&8 ASH HOPPER
OVERFLOW TANK
CAPACITY - (5000GALS.)
MAT'L. C.S.

16BA-106-LA
16BA-106-LB
MIXING EDUCTOR

FROM 7A & 7B
ASH SLUICE PUMPS
DWG. ME-3003-1 (C-3)

TO ASH PO
SHT. 3 (C-

UNIT 7 REHEAT
FURNACE ASH HOPPER

UNIT 7 SUPERHEAT
FURNACE ASH HOPPER

UNIT 7 PYRITES
S&L DWG. M800 (C-3)

HIGH PRESSURE
SERVICE WATER
S&L DWG. M800 (C-3)

LOW PRESSURE
SERVICE WATER
S&L DWG. M800 (C-3)

ASH HOPPER
OVERFLOWS

FRO
HEA
DWG

UNIT 7 AIR HEATER
WASH DRAINS METAL
CLEANING WASTE SYS.
DWG. ME-3005-1 (C-2)

16BA-116-T

MIXING
EDUCTORS

LS

16BA-106-LA 16BA-106-LB

S LSV 1A F.O.

S LSV 1A F.O.

TO METAL CLEANING
WASTE SYSTEM
DWG. ME 3005-4 (E-7)

TO MAIN
COLLECTION TANK
DWG. ME 3005-3 (D-7)

PI HS 16BA-128-PA

PI HS 16BA-128-PB

SERVICE WATER
FLUSH
S&L DWG. LATER

16BA-128-PA, 16BA-128-PB

ASH HOPPER O/F TANK PUMPS
CAP.: 1000 GPM
AT 25 FT. TDH
MAT'L. ALLOY C.I.

04960000184

BRUNING 44-131 28010

Electronic Filing: Received, Clerk's Office 10/31/2022

PARTS LIST						
REF	ITEM	DESCRIPTION	REQ'D	IDENTIFICATION		
				MATERIAL	PART NO. OR SPECIFICATION	

REVISIONS	
REV.	DESCRIPTION
A	ISSUED FOR INITIAL RELEASE 10-11-76
B	ISSUED FOR PROJECT REVIEW 10-11-76
C	ISSUED FOR CLIENT CONCEPT REVIEW 10-11-76
D	LAYOUT REARRGT. T.R.K. 1-29-77
E	ADDED EQUIP. NOS., CAP. & MISC. REVISIONS 2-15-77 SYS. ENGR. J.E.H. I & C. ENGR. J.E.H. COG ENGR. J.E.H. P.E.

SEE EQUIPMENT SPECIFICATION LIST DWG. ME3003-1

16BA-117-T
UNIT 8 ASH HOPPER
OVERFLOW TANK
CAPACITY -(5000 GALS.)
MAT'L. C.S.

16BA-107-LA
16BA-107-LB
MIXING EDUCTORS

UNIT 8 PYRITES
BECHTEL DWG. LATER

LOW PRESSURE
SERVICE WATER
BECHTEL DWG. LATER

TO ASH POND
SHT. 3 (C-7)

TO ASH POND
DWG. ME 3003-3 (C-7)

UNIT 8 REHEAT
FURNACE ASH HOPPER

UNIT 8 SUPERHEAT
FURNACE ASH HOPPER

UNIT 8
LOW LEVEL ECON.
JETPULSION PUMPS
(OUT OF SERVICE)

FROM UNIT 7&8
HEAD TANK
DWG. ME 3003-1 (D-2)

PI

PI

UNIT 8,
ASH SLUICE PUMPS

UNIT 8 AIR HEATER
WASH DRAINS METAL
CLEANING WASTE SYS.
DWG. ME-3005-2 (C-2)

LS

MIXING
EDUCTORS

16BA-117-T

16BA-107-LA

16BA-107-LB

S

1A

S

1A

TO METAL CLEANING
WASTE SYSTEM
DWG. ME 3005-4 (E-7)

TO MAIN
COLLECTION TANK
DWG. ME 3005-3 (D-7)

F.O.

F.O.

PI

PI

HS

HS

16BA-129-PA

16BA-129-PB

SERVICE WATER
FLUSH BECHTEL
DWG. LATER

16BA-129-PA, 16BA-129-PB

ASH HOPPER O/F TANK PUMPS
CAP.: 1000 GPM
AT 25 FT. TDH
MAT'L. ALLOY C.I.

04960000185

DRAWING STATUS

PRELIMINARY

		Date
DRAWN	O.R. Strasser	14 JAN. 77
CHECKED	T.R. Kuny	1/24/77
COG. ENGINEER		
DISCIP. MGR. APPVL.		
APPROVAL,		
APPROVAL,		
APPROVAL, PROJ.		
APPROVAL, CLIENT		

COMMONWEALTH EDISON COMPANY
WASTE WATER TREATMENT FACILITIES-WAUKEGAN

BOTTOM ASH SLUICE SYSTEM
PIPING & INSTRUMENTATION DIAG.

CECO CONTRACT 802670 | CECO DWG NO. | REV.

NUS CORPORATION
ROCKVILLE, MD.

DRAWING NO. 5082ME3003 | REV. E

SCALE: NONE | SHEET 2 OF 5

Electronic Filing: Received, Clerk's Office 10/31/2022

STATE OF ILLINOIS

ENVIRONMENTAL PROTECTION AGENCY

The preceding 1 image(s) are partially illegible in the copy sent to be microfilmed. The resulting microfilm may be illegible for use.

Signed: Leon C. Baker

ADM-1041A REV. (4/77)

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Electronic Filing: Received, Clerk's Office 10/31/2022

DWG. NO. 5082ME3003 REV. E

16BA-105-T
MAIN COLLECTION TANK
CAP: 15,000 GAL.
MAT'L. C.S.

16BA-101-X
AIR SPARGER
CAP: later

16BA-100-NA
ASH POND 1
CAP: 10 ACRES x 15' DP
MAT'L. EARTHEN HYPALON LINED

FROM ACID METERING PUMPS
DWG. ME3003-5 (C-1)

FROM UNIT 5 BACKUP HYDROJACTOR
DWG. ME3003-1 (C-5)

FROM UNIT 5 & 6 DEWATERING
BIN OVERFLOW & UNDERFLOW
DWG. ME3003-1 (B-3)

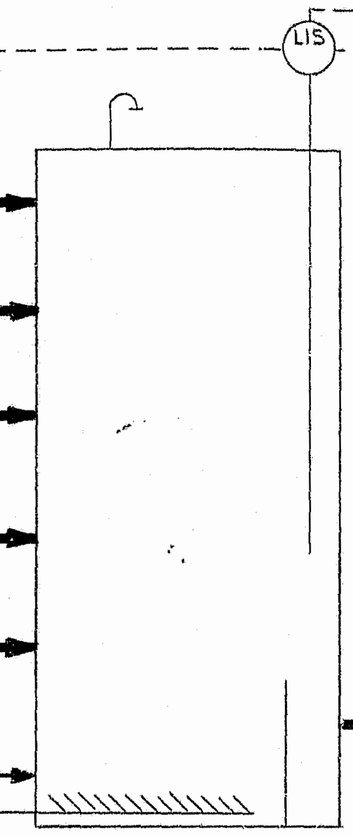
FROM HEAD TANK OVERFLOW
DWG. ME3003-1 (D-3)

FROM OVERFLOW TANK
UNIT 7
DWG. ME3003-2 (B-4)

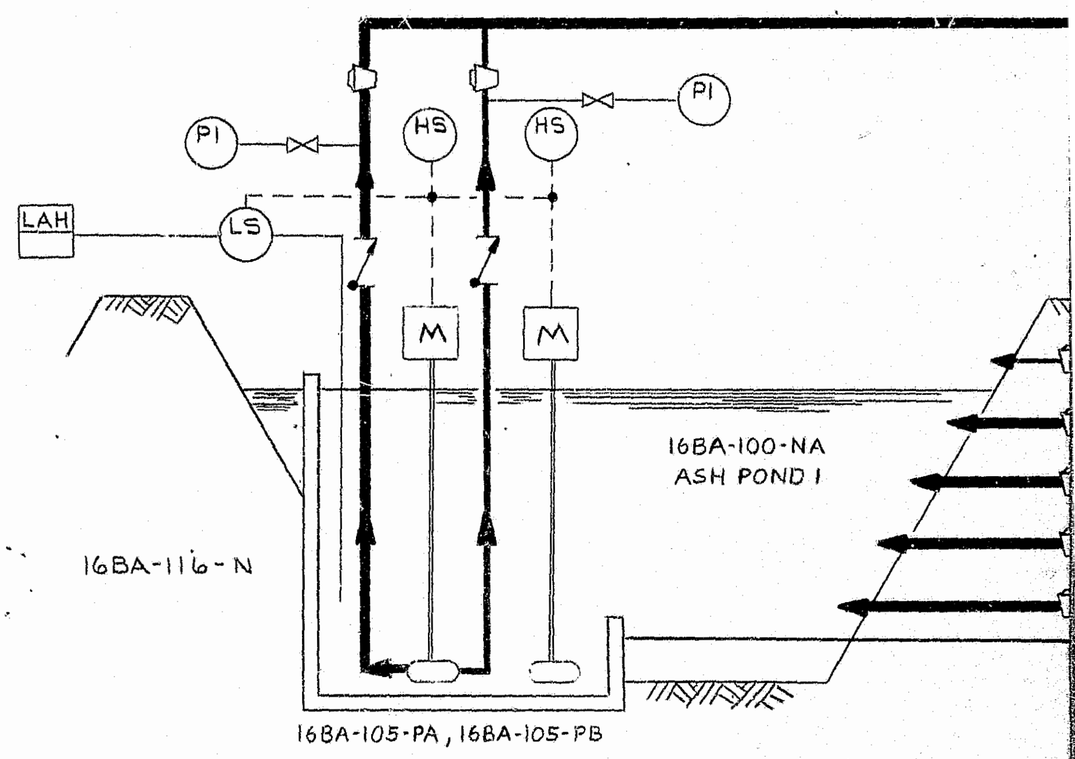
FROM OVERFLOW TANK
UNIT 8
DWG. ME3003-2 (B-2)

FROM FILTER BACKWASH
DWG. ME later

FROM B/C OVERFLOW SUMP
BOTTOM ASH SLUICE SYSTEM
DWG. ME3003-4 (C-1)



16BA-105-T, 16BA-101-X



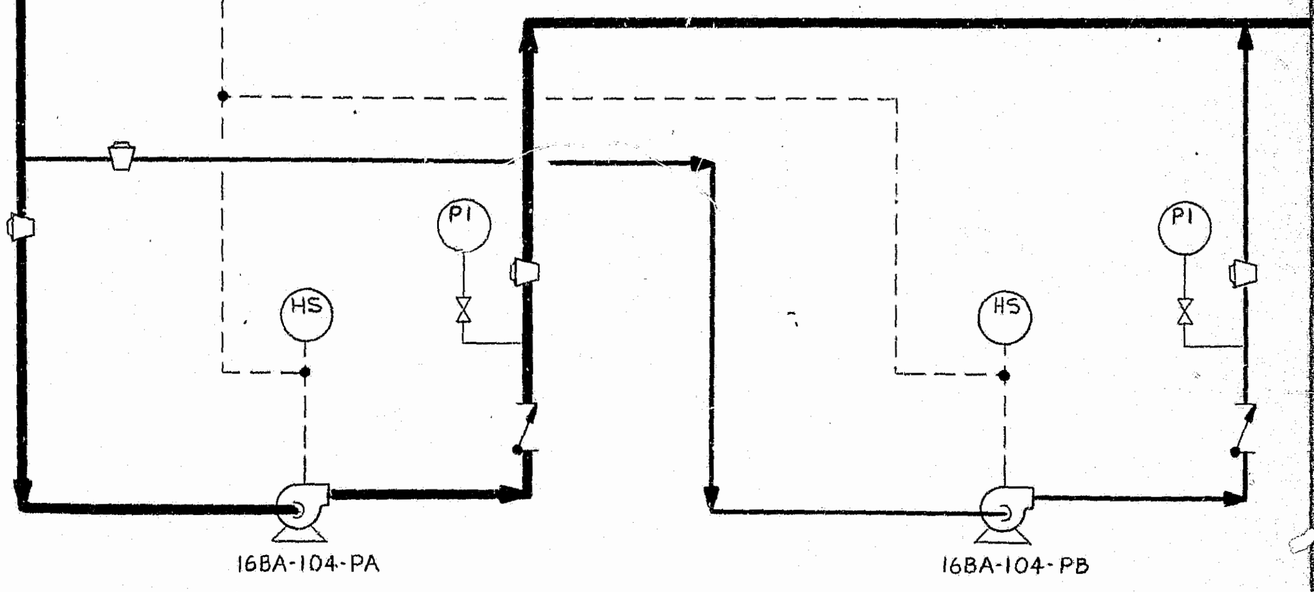
16BA-105-PA, 16BA-105-PB

FROM UNITS 6,7, & 8 ECONOMIZER
ASH COLLECTION TANK
DWG. ME-3021 (B-2)

FROM UNIT 7 ASH
HOPPER SLUICE
DWG. ME3003-2 (E-4)

FROM UNIT 8 ASH
HOPPER SLUICE
DWG. ME3003-2 (E-1)

FROM B/C SLUDGE SUMP
BOTTOM ASH SLUICE SYSTEM
DWG. ME3003-4 (B-5)

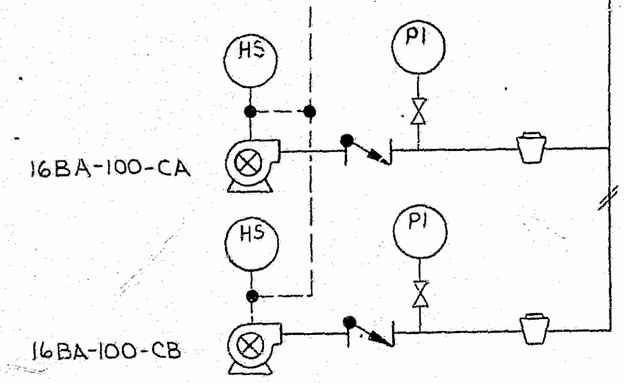


16BA-104-PA, 16BA-104-PB

MAIN COLLECTION TANK PUMPS
EACH CAP. 12,000 G.P.H.
@ 80 FT. TDH
MAT'L. CONCRETE

16BA-116-N
SLUICE WATER RETURN SUMP
CAP: 60,000 GAL. 30'x15'x18 DP
MAT'L. CONCRETE

16BA-105-PA, 16BA-105-PB
SLUICE WATER RETURN SUMP PUMPS
EACH CAP: 7500 GPM @ 50 FT. TDH
MAT'L. C.I.



16BA-100-CA & CB

AIR BLOWERS
EACH CAP: 400 CFM @ 6 PSI
H.P. later

0496000187

BRUNING 28010

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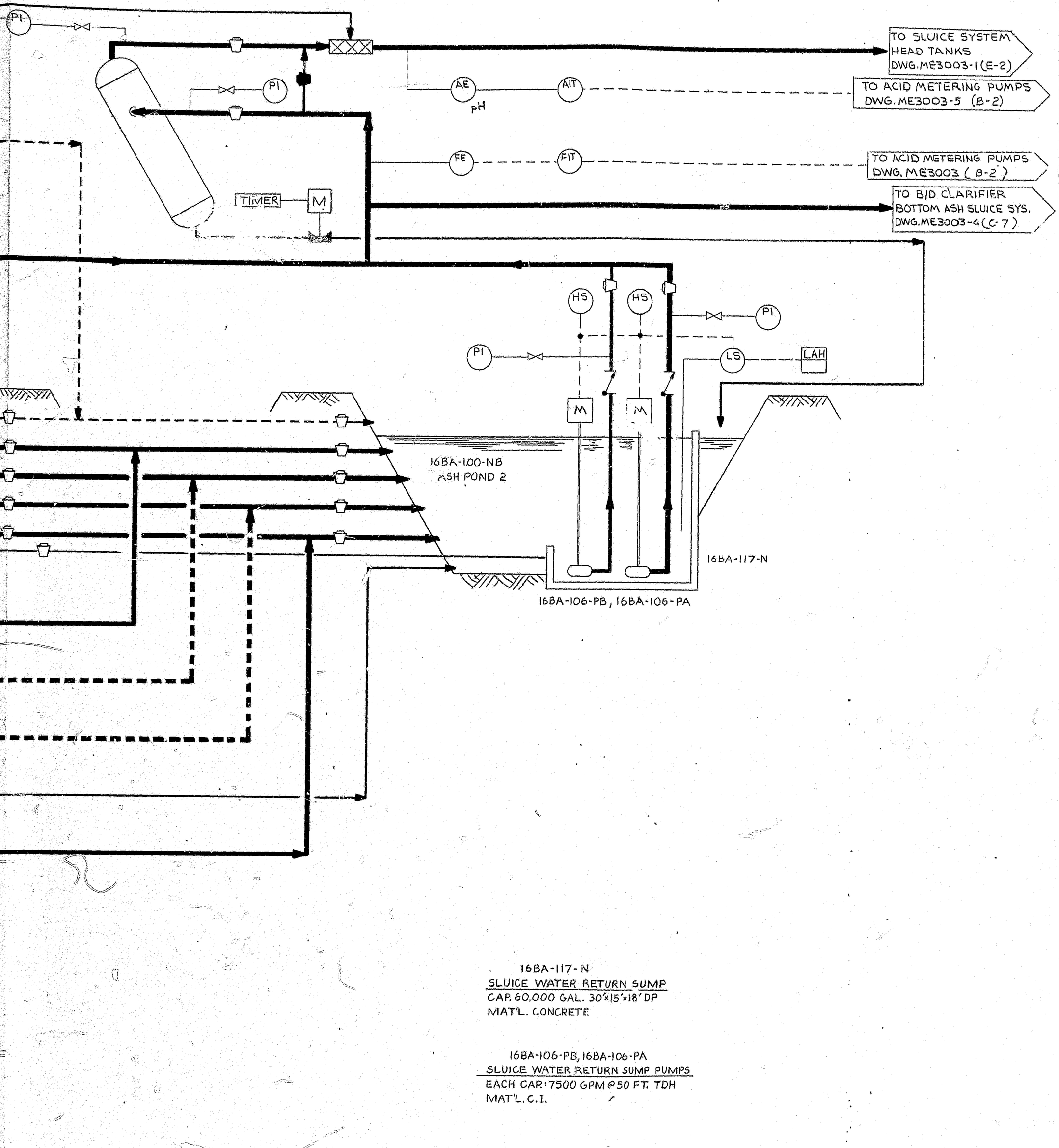
16BA-100-FA&B
CENTRIFUGAL SEPARATORS
CAP.: 11,000 GPM
MAT'L. C.S.

16BA-100-L
STATIC MIXER
CAP.: later

16BA-100-NB
ASH POND
CAP. 10 ACRES × 15' DP
MAT'L. EARTHEN
HYPALON LINED

SEE EQUIPMENT SPECIFICATION LIST DWG. ME3003-1

REVISIONS	
REV.	DESCRIPTION
A	INITIAL RELEASE
B	FOR REVIEW GEB - 9-29-76
C	ISSUED FOR CLIENT CONCEPT REVIEW
D	LAYOUT REARRANGE'T [illegible] 1-29-77
E	REMOVED SEPARATOR U/F SUMP, ADDED EQUIP. NOS., CAP & MISC REVISIONS 2-15-77 SYS. ENGR. J.E. Hamburg I&C ENGR. R.J. [illegible] COG ENGR. J.K. Hanks P.E. [illegible]



16BA-117-N
SLUICE WATER RETURN SUMP
CAP. 60,000 GAL. 30'×15'×18' DP
MAT'L. CONCRETE

16BA-106-PB, 16BA-106-PA
SLUICE WATER RETURN SUMP PUMPS
EACH CAP.: 7500 GPM @ 50 FT. TDH
MAT'L. C.I.

04960000188

DRAWING STATUS
PRELIMINARY

	Date
DRAWN G. Bugden	1/10/77
CHECKED K.R. Kung	1/5/77
COG. ENGINEER	
DISCIP. MGR. APPVL.	
APPROVAL,	
APPROVAL,	
APPROVAL, PROJ.	
APPROVAL, CLIENT	

COMMONWEALTH EDISON COMPANY
WASTEWATER TREATMENT FACILITIES - WAUKEGAN

BOTTOM ASH SLUICE SYS.
PIPING & INSTRUMENT DIAGRAM

CECO. CONTRACT 802670 | CECO. DWG. NO. | REV.

NUS CORPORATION ROCKVILLE, MD.

DRAWING NO. 5082ME3003 REV. E

SCALE: NONE SHEET 3 OF 5

Electronic Filing: Received, Clerk's Office 10/31/2022

16BA-100-DA-INTERNALS
16BA-112-NA-CONTAINER
BLOWDOWN CLARIFIER
CAP: 85'Ø X 14' DP. W/12' SWD
MAT'L. 85'Ø CONC. W/C.S. INTERNALS

16BA-100-DB-IN
16BA-112-NB-CO
BLOWDOWN CLA
CAP: 85'Ø X 14' DP
MAT'L. 85'Ø CONC. W

FROM MTL. CLNG. WA. SYS.
DWG. ME 3005-4 (D-1)

FROM POLYMER FEED SYS.
DWG. ME 3003-5 (D-1)

FROM SLUICE WTR. RET. SUMP
BOTTOM ASH SLUICE SYS.
DWG ME 3003-3 (D-1)

FROM L P SERVICE WTR. SYST.
DWG. LATER

TO POLYMER FEED PKG DWG ME3003-5(C-2)

TIMER

FROM ACID METERING PUMP
DWG ME 3003-5 (C-1)

FROM POLYMER FD. SYST. DRAINS
DWG. ME 3003-5 (C-1)

TO U/F SLUDGE SUMP
DWG. ME 3005-4 (C-1)

TO ASH POND 2
BOTTOM ASH SLUICE SYS.
DWG. ME 3003-3 (C-7)

TO MC. WASTE SLUDGE FILTER
DWG ME3005

O/F NEUTRALIZATION SUMP
ME 3005-4 (C-1)

16BA-107-PA 16BA-107-PB

16BA-102-N
BLOWDOWN CLARIFIER SLUDGE SUMP
CAP: 6,700 8'-6" x 14' DP.
MAT'L. CONCRETE

16BA-107-PA & 16BA-107-PB
BLOWDOWN CLARIFIER SLUDGE SUMP PUMPS
EACH CAP: 250 GPM, 112 F.T. TDH
MAT'L. C.I.

04960000189

Electronic Filing Received, Clerk's Office 10/31/2022

00-DB-INTERNALS
16'-NB CONTAINER
CLARIFIER
1'Ø X 14'DP W/12 SWD
5'Ø CONC. W/C.S. INTERNALS

PARTS LIST					
REF	ITEM	DESCRIPTION	REQ'D	IDENTIFICATION	
				MATERIAL	PART NO. OR SPECIFICATION

SEE EQUIPMENT SPECIFICATION LIST DWG. ME 3003-1

REVISIONS		
	BY.	DESCRIPTION
A		ISSUED FOR INITIAL REVIEW 1-28-76
B		ISSUED FOR PROJECT REVIEW 1-29-76
C		ISSUED FOR CLIENT CONCEPT REVIEW 10-11-76 SYS ENGR I&C ENG. COG ENG PROJ ENG
D		LAYOUT REDRAW 1-29-77 O.R. Strother
E		ADDED EQUIP. NOS., CAP. & MISC. REVISIONS 2-15-77 SYS.ENGR. J.L. Hamburger I&C ENGR. D. Hamilton COG. ENGR. J.L. Hamburger P.E. L. Yarda

TO OVERFLOW SUMP
METAL CLEANING WASTE SYS.
DWG. ME3005-4 (C-1)

TO MAIN COLLECTION TANK
BOTTOM ASH SLUICE SYS.
DWG. ME 3003-3 (C-7)

TO DISCHARGE CANAL

GRAB SAMPLE

TO ACID METERING PUMPS DWG ME3003-5 (C-6)

AMBIENT INPUT

INTERLOCK

BAFFLE

16BA-108-PA 16BA-108-PB

16BA-103-N
CLARIFIER OVERFLOW SUMP
CAP. 30,000 GAL. 20'x20'x10' DP.
MAT'L. CONCRETE

16BA-108-PA & 16BA-108-PB
CLARIFIER O/F SUMP PUMPS
EACH CAP. 5000 GPM, 50 FT. TDH
MAT'L. - C.I.

16BA-106-L
CLARIFIER O/F SUMP MIXER
CAP.:
MAT'L.

04960000190

DRAWING STATUS
PRELIMINARY

		Date
DRAWN	R.P.C.	2-17-77
CHECKED	M.R. Kuy	2/17/77
COG. ENGINEER		
DISCIP. MGR. APPVL.		
APPROVAL		
APPROVAL		
APPROVAL, PROJ.		
APPROVAL, CLIENT		

COMMONWEALTH EDISON COMPANY
WASTE WATER TREATMENT FACILITIES - WAUKEGAN

BOTTOM ASH SLUICE SYSTEM
PIPING & INSTRUMENT DIAGRAM

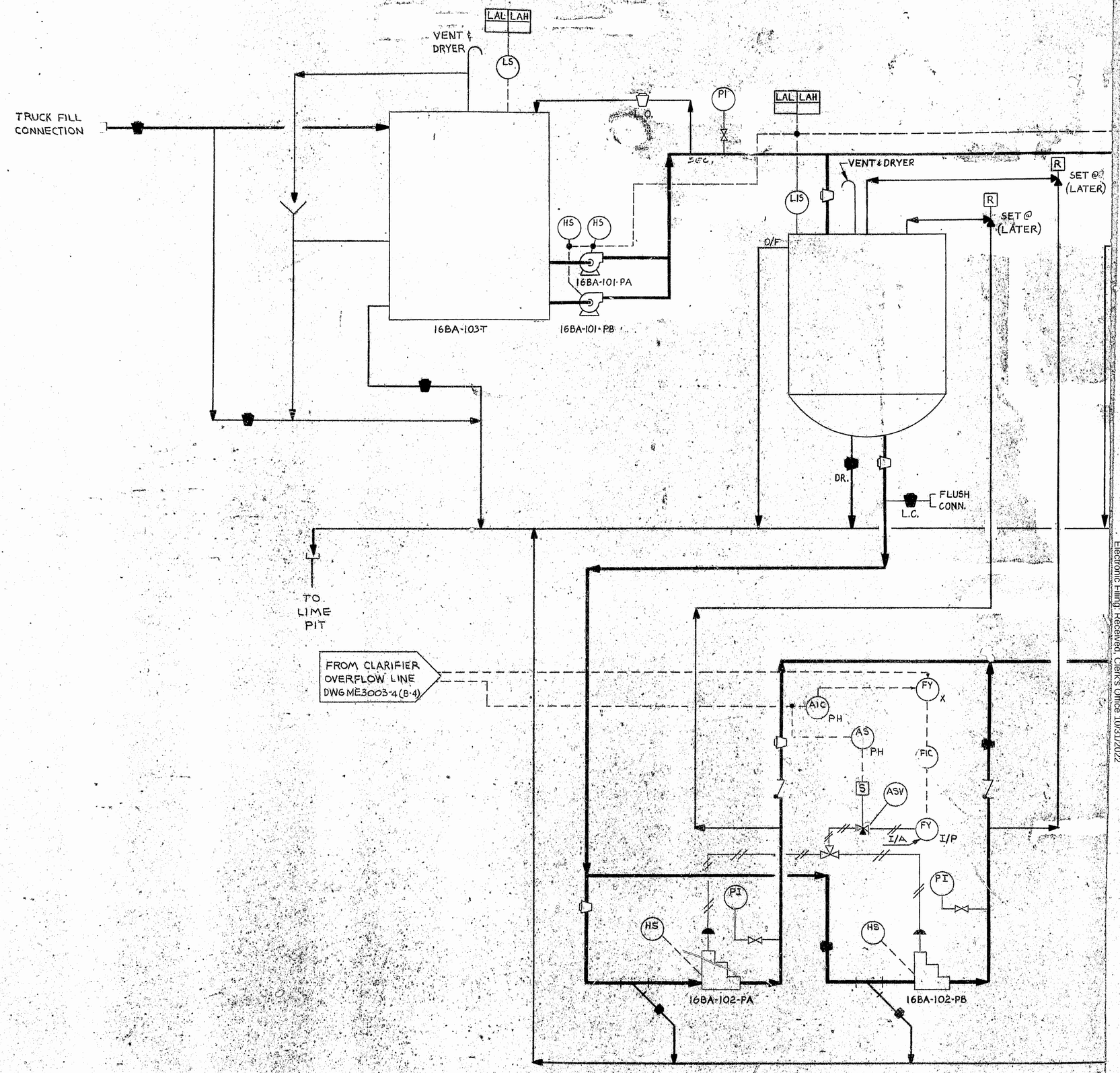
CECO CONTRACT 802669 | CECO DWG NO. | REV

NUS CORPORATION ROCKVILLE, MD. | DRAWING NO. 5082 ME3003 | REV. E | SCALE: NONE | SHEET 4 OF 5

Electronic Filing: Received, Clerk's Office 10/31/2022

16BA-103-T
ACID STORAGE TANK
CAP: 70,000 GALS, VERTICAL
MAT'L. EPOXY PHENOCLIC LINED C.S.

16BA-104-T
ACID DAY TANK
CAP. 500 GALS.,
MAT'L. PVC LINED C.S.



16BA-101-PA, 16BA-101-PB
ACID TRANSFER PUMPS
EACH CAP: 100 GPM @ 25 FT. TDH
MAT'L. PVC

16BA-102-PA
ACID METERING PUMP
CAP: VARIABLE SPEED/STROKE
20 GPH @ 10 PSI
MAT'L. S.S.

16BA-102-PB
ACID METERING PUMP
CAP: VARIABLE SPEED/STROKE
20 GPH @ 10 PSI
MAT'L. S.S.

04960000191

Electronic Filing: Received, Clerk's Office 10/31/2022

BRUNING 44-131 28010

PARTS LIST					
REF	ITEM	DESCRIPTION	REQ'D	IDENTIFICATION MATERIAL	IDENTIFICATION PART NO. OR SPECIFICATION

REVISIONS	
REV.	DESCRIPTION
A	INITIAL ... ASE
B	FOR REVIEW GEB 11/29/76
C	ISSUED FOR CLIENT CONCEPT REVIEW
D	LAYOUT REDRAW 1-29-77 O.R. Stricker
E	ADDED EQUIP. NO'S, SAP. # MISC. REVISIONS 2-15-77 SYS.ENGR. J.A. Hamilton I&C ENGR. T.D. Smith COG.ENGR. J.R. Hundley P.E. L. Jandl

16BA-100-S
ACID DAY TANK
CAP. 600 GALS.
MAT'L. PVC LINED C.S.

16BA-100-S
POLYMER FEED PACKAGE

SEE EQUIPMENT SPECIFICATION LIST
DWG. ME-3003-1

SET @ (LATER)

SET @ (LATER)

SET @ (LATER)

LAL LAH

VENT & DRYER

LIS

O/F

DR.

FLUSH CONN.

SERV. WATER

AIR

FOR PACKAGE P I D SEE DWG. C-M2001

TO BLOWDOWN CLARIFIER DWG. ME3003-4 (D-7)

FROM BLOWDOWN CLARIFIER DWG. ME3003-4 (C-6)

DRAINS

TO CLARIFIER SLUDGE SUMP DWG. ME3003-4 (B-7)

TO CLARIFIER OVERFLOW LINE DWG. ME3003-4 (C-7)

TO SLUICE SYSTEM RECYCLE LINE DWG. ME3003-3 (E-7)

AS PH

AIC PH

FY X

S

ASV

I/A

FY I/P

FIC

FROM SLUICE SYS. RECYCLE LINE ME3003-3 (E-1)

FROM SLUICE SYS. RECYCLE LINE DWG. ME3003-3 (E-1)

HS

PI

16BA-103-PA

HS

PI

16BA-103-PB

16BA-103-PA
ACID METERING PUMP
CAP: VARIABLE SPEED/STROKE
45 GPH @ 25 PSI
MAT'L. S.S.

16BA-103-PB
ACID METERING PUMP
CAP: VARIABLE SPEED/STROKE
45 GPH @ 25 PSI
MAT'L. S.S.

04960000192

DRAWING STATUS
PRELIMINARY

	Date
Drawn G. Bagdas	12/14/76
CHECKED T.K. Kumar	12/21/76
COG. ENGINEER	
DISCIP. MGR. APPV'L	
APPROVAL	
APPROVAL	
APPROVAL, PROJ.	
APPROVAL, CLIENT	

COMMONWEALTH EDISON COMPANY
WASTE WATER TREATMENT FACILITIES-WAUKEGAN
BOTTOM ASH SLUICE SYSTEM
PIPING & INSTRUMENT DIAGRAM

CECO. CONTRACT 802670
CECO DWG. NO. 5082ME3003
REV. E
NUS CORPORATION ROCKVILLE, MD.
SCALE: NONE
SHEET 5 OF 5

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DWG. NO. 5082ME3021 REV. D

UNIT 6 - 8 EXISTING
ECONOMIZER F.A. HOPPERS
2.43 TON/DAY FLY ASH

UNIT 7 - 8 EXISTING
ECONOMIZER F.A. HOPPERS
25.1 TON/DAY F.A.

ATMOSPHERIC VENT TO ROOF

HOPPER VAC. PURGE VALVES

6"-F.A.

REDUNDANT CONN. TO SILOS

6"-F.A.

6"-F.A.

6"-F.A.

UNIT 6 HYDROVEYOR

UNIT 6 ASH SLUICE PUMPS S&L DWG NO. later

8" AHS

AHS 8"

AHS 6"

AHS 6"

AHS 4"

E later

6" E.A.S. ASHCOLITE

8" I VERTICAL

8" O/F

UNIT 6 AIR SEPARATOR TANK

UNIT 7 ASH SLUICE PUMPS S&L DWG NO. later

4" N.O.

H.P. SERVICE WATER S&L DWG NO. later

4" N.C.

FLG. EL. 13'-6 ABOVE FLOOR

FLG. EL. 52'-0" ABOVE FLOOR

E.A.S.

6"-E.A.S.-ASHCOLITE

E later

FROM BLR 17 - SLAG TANK OVERFLOW

AHS 10"-later-later SLOPE

XL

HS

LS

M

EAS 10" SLO

C.O.

EAS 8"-later-later ASHCOLITE SLOPE

PU A

BAFFLE

CONTINUOUS MIXER (SEE NOTE 2)

NOTES:

1. PRIMARY SYSTEM PROPOSED: NEW GRAVITY DRAIN LINES FROM UNITS 6 & 7 AIR SEPARATOR TANKS: RELOCATE U8 AIR SEPARATOR TANK @ ≈ ELEV. 66'-6" ABOVE FLOOR & PROVIDE GRAVITY LINE TO NEW 8' DIA. X 8' HIGH SLUICE TK. ON FLOOR W/3 HOR. CENT. 1200 GPM PUMPS & ELEC. CONT. MIXER INSIDE TK. TO PREVENT F.A. SETTLING. NEW 10" LINE TO ASH POND FOLLOWING SAME ROUTING AS EXISTING ASH SLUICE LINES. LINE LENGTH IS APPROX. 2000 L.F.
2. MIXER TO RUN AS LONG AS THERE IS LIQUID IN TANK. LEVEL SWITCH TO HAVE ZERO SPEED SWITCH WITH A/V ALARM.

16EA-123-T
ECONOMIZER F.A. SLUICE TANK
CAP: 3000 GALS., 8'ø X 8' HIGH
MATL: CARBON STEEL

16EA-108-L
CONTINUOUS MIXER
CAP: [illegible] RPM, 1 HP
MATL: CARBON STEEL

04960000193

BRUNING 44-131 28010

Electronic Filing: Received, Clerk's Office 10/31/2022

PARTS LIST						
REF	ITEM	DESCRIPTION	REQ'D		IDENTIFICATION	
					MATERIAL	PART NO. OR SPECIFICATION

REVISIONS	
REV.	DESCRIPTION
A	ISSUED FOR INITIAL REVIEW G Boyden 11-30-76
B	ISSUED FOR PROJECT REVIEW T.P.K. 1-3-77
C	ISSUED FOR CLIENT CONCEPT REVIEW 1-7-77 SYS. ENGR. Ga Spoolman I&C ENGR. Mauble COG. ENGR. LDK PROJ. ENGR.
D	ADD EQUIP NOS. & MISC. REVISIONS SYS. ENGR. JR Hunt I&C ENGR. COG. ENGR. JR Hunt PROJ. ENGR.

UNIT 8 - 6 EXISTING
ECONOMIZER HOPPERS
28.0 TON/DAY F.A.

ATMOSPHERIC VENT TO ROOF

HOPPER VAC. PURGE VALVES

6"-F.A.

F.A.

10"-I VERTICAL

5 EACH VACUUM CONNECTIONS ON BLR. ROOM FLOOR

6"-F.A.

4"-F.A.

UNIT 7 HYDRO-VEYOR

4" A.H.S.

6" E.A.S.

UNIT 7 AIR SEPARATOR TANK

8" O/F E.A.S.

10"-EAS

C.O.

EAS 10"-later-later

SLOPE

EAS 8"-later-later

52'-0" FLOOR

4"-F.A.

UNIT 8 HYDRO-VEYOR

6"-A.H.S.

6"-A.H.S.

UNIT 8 ASH SLUICE PUMPS S&L DWG NO. Lite

4" N.C.

10" I

HORIZONTAL ATMOS. VENT TO OUTSIDE

10"-E.A.S.

UNIT 8 AIR SEPARATOR TANK

8"-E.A.S.

C.O.

(EXIST. EL. 12'-0" OFF FLOOR)
HYDROVEYOR & AIR SEP. TK. MUST BE RAISED TO 66'-6" ABOVE FLOOR

LAH
HS
PI
LS
LS

EAS 10"-later-later

TO ASH POND
≈ 2000 L.F
DWG. ME3003-3 (C-7)

EAS 6"-later-later

16EA-136-PA

L.O.

PU A

BAFFLE

EAS 8"-later-later

EAS 6"-later-later

16EA-136-PB

L.O.

EAS 6"-later-later

16EA-136-PC

16EA-136-PA, PB, PC

ECONOMIZER F.A. SLUICE PUMPS
EACH CAP: 1200 GPM @ 100 FT TDH
MATL: ALLOY CARBON STEEL
VORTEX TYPE IMPELLERS FOR ABRASIVE RESISTANCE

04960000194

DRAWING STATUS

PRELIMINARY

	Date
DRAWN G Boyden	11/30/76
CHECKED T.P.K.	1/3/77
COG. ENGINEER	
DISCIP. MGR. APPVL.	
APPROVAL,	
APPROVAL,	
APPROVAL, PROJ.	
APPROVAL, CLIENT	

COMMONWEALTH EDISON COMPANY
WASTE WATER TREATMENT FACILITIES-WAUKEGAN

ECONOMIZER FLY ASH SYSTEM PIPING & INSTRUMENT DIAGRAM

CECO CONTRACT 802670

CECO DWG. NO.

REV

NUS CORPORATION
ROCKVILLE, MD.

DRAWING NO. 5082ME3021

REV. D

SCALE: NONE

SHEET 1 OF 1

Electronic Filing: Received, Clerk's Office 10/31/2022

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STATE OF ILLINOIS

ENVIRONMENTAL PROTECTION AGENCY

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The resulting microfilm may be illegible for use.

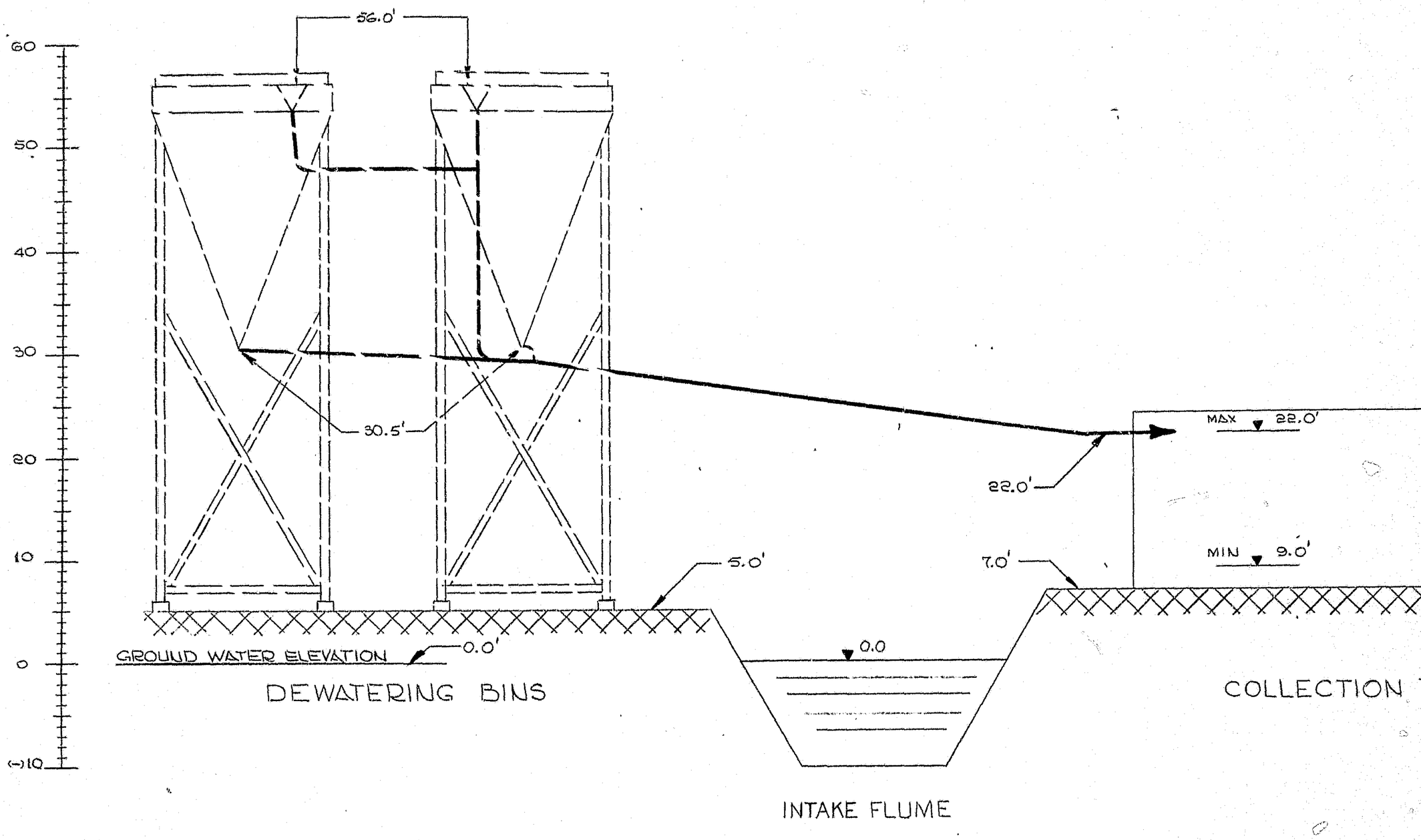
Signed: Leon C. Baker

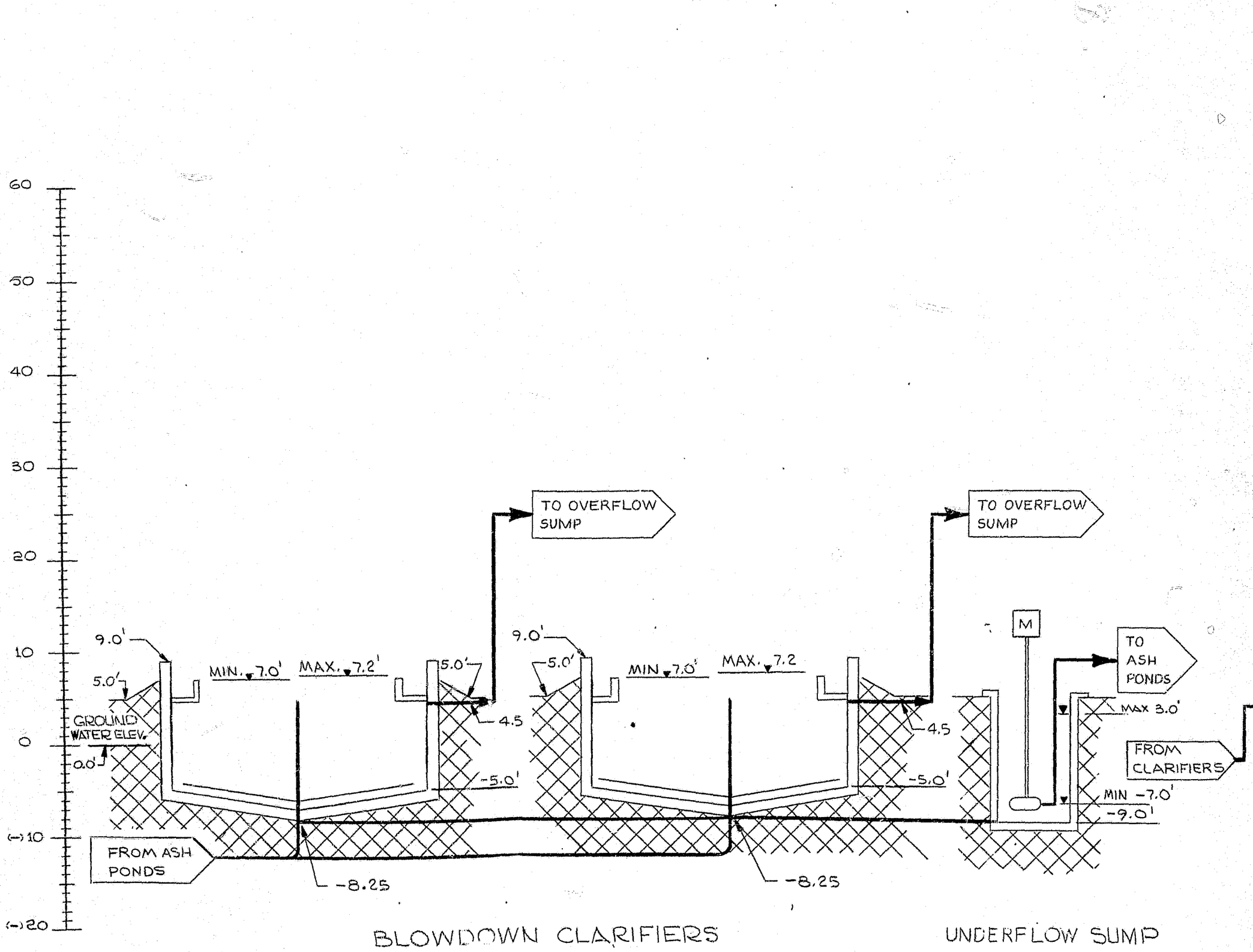
ADM-1041A REV. (4/77)

IEPA/BOL

Electronic Filing: Received, Clerk's Office 10/31/2022

DWG. NO. 5082ME3015
REV. D





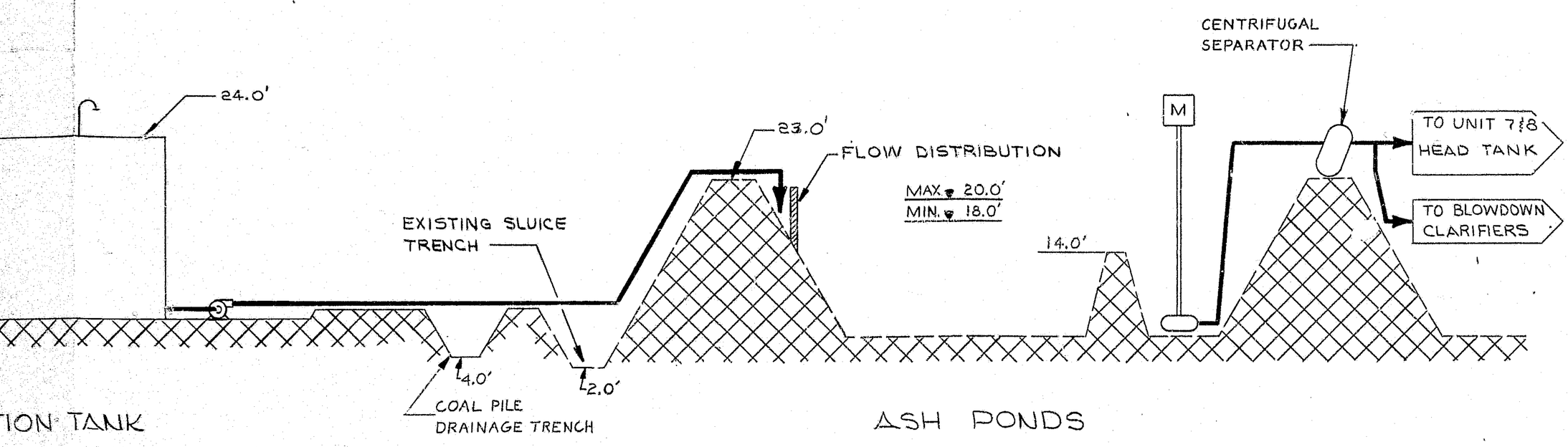
04960000196

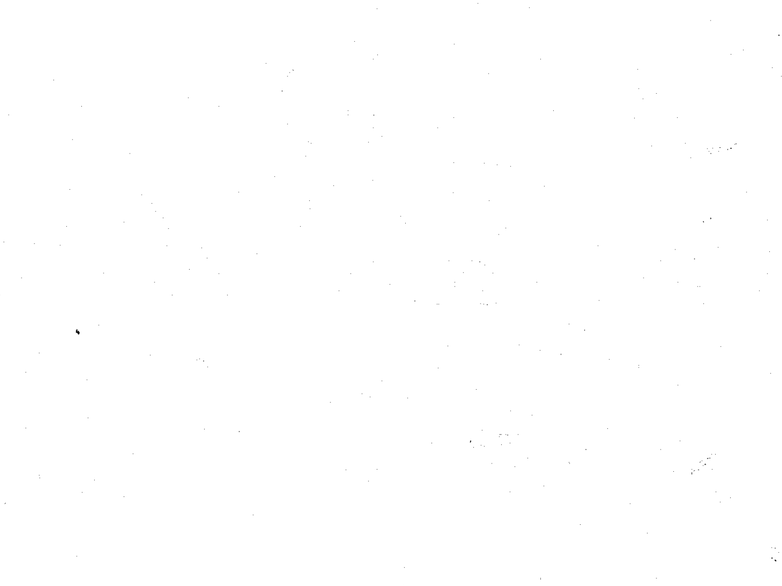
BRUNING 44-131 28010

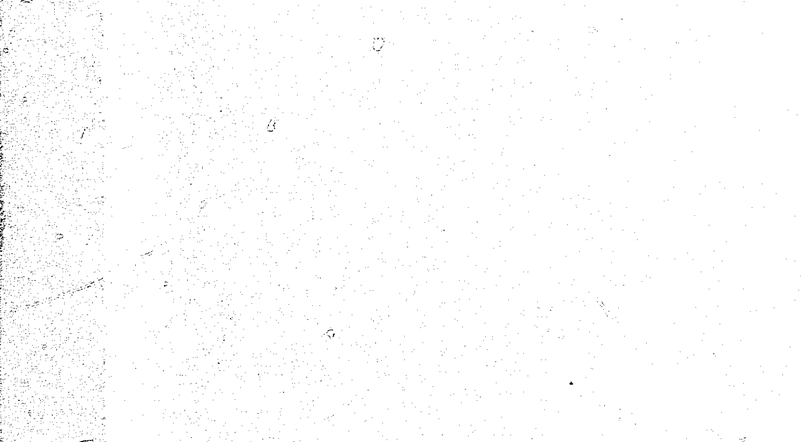
Electronic Filing: Received, Clerk's Office 10/31/2022

PARTS LIST						
REF	ITEM	DESCRIPTION	REQ'D	IDENTIFICATION		
				MATERIAL	PART NO. OR SPECIFICATION	

REVISIONS	
REV.	DESCRIPTION
A	ISSUED FOR INITIAL REVIEW
B	FOR SECONDARY REVIEW CHECKER [illegible] 9-21-76
C	ISSUED FOR CLIENT CONCEPT REVIEW. DATE 10-1-76 SYSTEM ENGR. COG. ENGR. J. R. Hanlon P.E.
D	REVISED MISC. ELEVATIONS 2-[illegible]-77 SYS ENGR. J. R. Hanlon COG. ENGR. J. R. Hanlon CIVIL ENGR. R. E. Lounsbury PROJ. ENGR. [illegible]







OVERFLOW SUMP

0496000197

DRAWING STATUS

PRELIMINARY

	Date
DRAWN J. MESZAROS	8/31/1976
CHECKED H Hanlon	9/2/76
COG. ENGINEER	
DISCIP. MGR. APPVL.	
APPROVAL,	
APPROVAL,	
APPROVAL, PROJ.	
APPROVAL, CLIENT	

COMMONWEALTH EDISON COMPANY
WASTEWATER TREATMENT FACILITIES-WAUKEGAN

BOTTOM ASH SLUICE SYSTEM HYDRAULIC PROFILE

CECO CONTRACT 802670 | CECO DWG NO.

NUS CORPORATION ROCKVILLE, MD.

DRAWING NO. 5082ME3015 | REV. D

SCALE: 1/8" = 1'-0" | SHEET 1 OF 1

Electronic Filing: Received, Clerk's Office 10/31/2022

STATE OF ILLINOIS

ENVIRONMENTAL PROTECTION AGENCY

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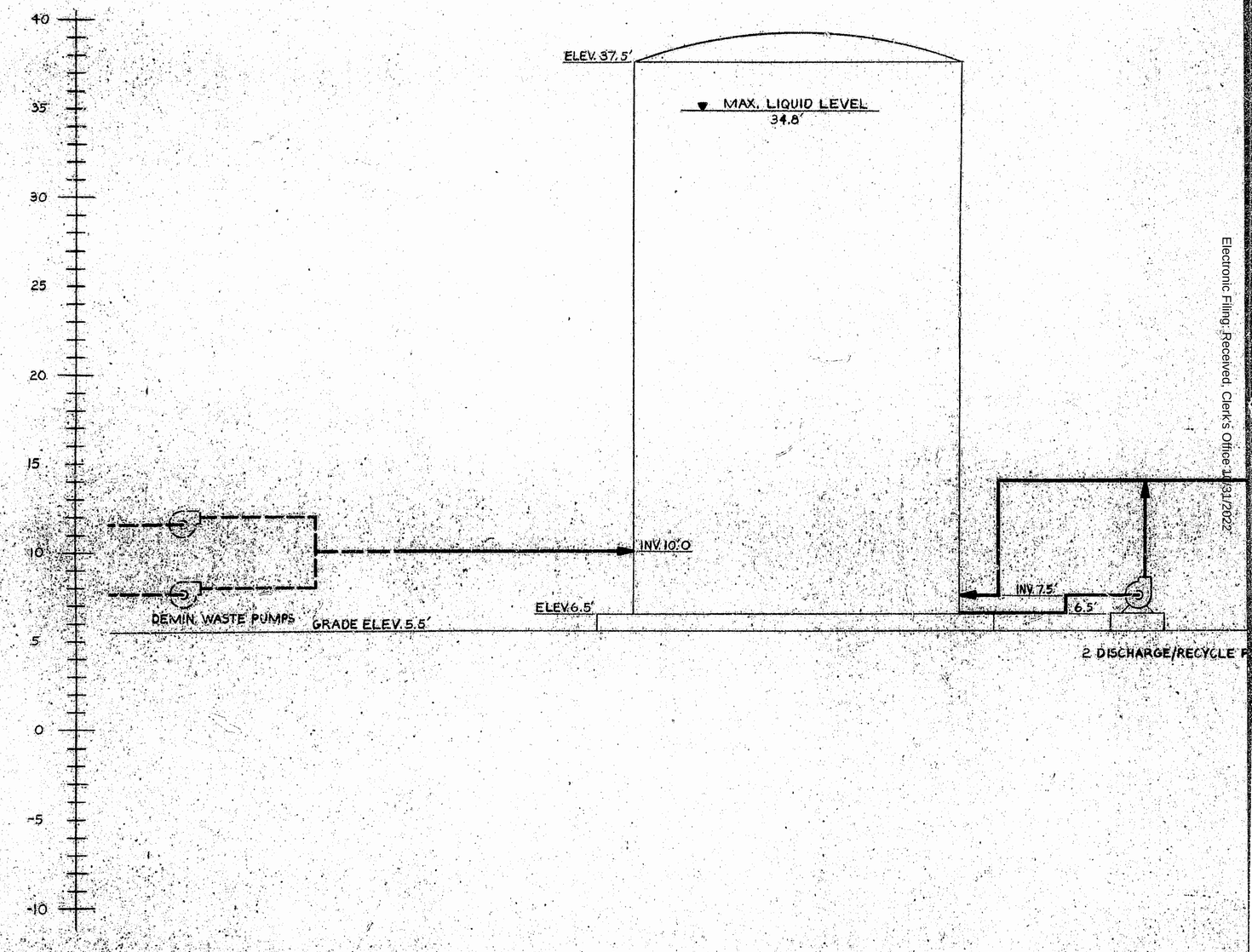
Signed: Leon C. Baker

ADM-1041A REV. (4/77)

0400010198

DWG. NO. 5082ME3016 REV. A

EQUALIZATION TANK
CAP.: 150,000 GAL. 30'ϕ × 31'H.



ELEVATION SCALE
ELEV. 0 - 580564

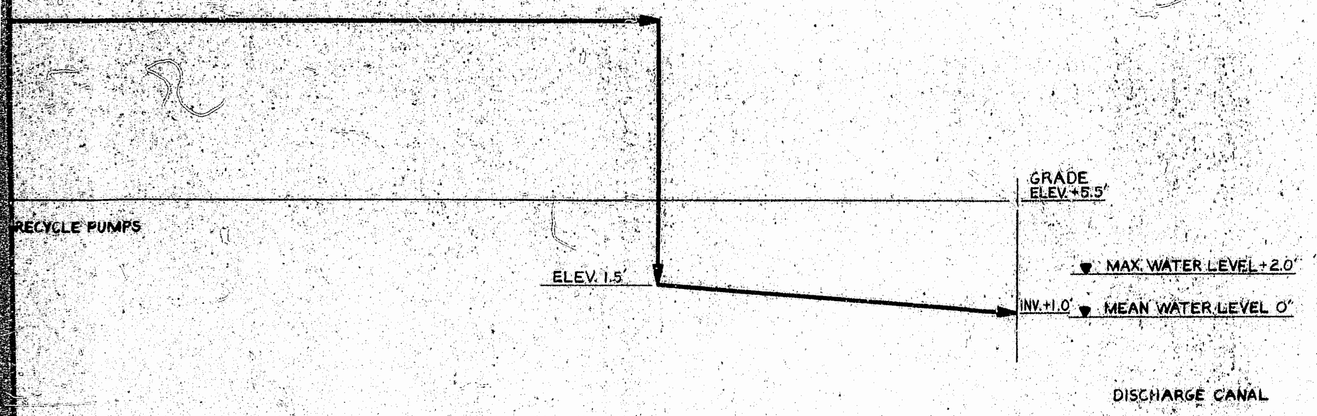
Electronic Filing: Received, Clerk's Office 1/31/2022

PARTS LIST					
REF	ITEM	DESCRIPTION	REQ'D	IDENTIFICATION	
				MATERIAL	PART NO. OR SPECIFICATION

REVISIONS	
REV.	DESCRIPTION
A	INITIAL ISSUE 2-18-77 SYS. ENGR. [signature] CIVIL ENGR. [signature] COG. ENGR. [signature] P.E. [signature]

NOTES:

1. THE ELEVATION SHOWN HEREIN REFER TO WAUKEGAN CITY DATUM. TO CONVERT TO MEAN SEA LEVEL ADD 580.564 FEET.



04960000200

DRAWING STATUS

PRELIMINARY

	Date
DRAWN O.R. Stricker	18 Feb 77
CHECKED	
COG. ENGINEER	
DISCIP. MGR. APPVL.	
APPROVAL, ———	
APPROVAL, ———	
APPROVAL, PROJ.	
APPROVAL, CLIENT	

COMMONWEALTH EDISON COMPANY
WASTEWATER TREATMENT FACILITIES-WAUKEGAN
DEMIN. WASTE EQUALIZATION SYSTEM
HYDRAULIC PROFILE

CECO CONTRACT 802670 | CECO DWG. NO. | REV.

NUS CORPORATION ROCKVILLE, MD. | DRAWING NO. 5082ME3016 | REV. A

SCALE: | SHEET 1 OF 1

Electronic Filing Received Clerk's Office 10/31/2022

Electronic Filing: Received, Clerk's Office 10/31/2022

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STATE OF ILLINOIS

ENVIRONMENTAL PROTECTION AGENCY

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Signed: Leon C. Baker

ADM-1041A REV. (4/77)

04?(0000201

0456CC00202

BRUNING 24010

A

B

C

D

E

JET PUMP

AH6"

BA 10"

AH6"

CLINKER GRINDER

AH 6"

UNIT 7A & 7B ASH SLUICE PUMPS DWG. ME3005-1 (C-3)

ASH HOPPER 7 B

1½"

OVERFLOW 8"

4" CROSS CONNECTION TO

1½" BACKFLUSH LINE

MC

NEW CO.

MC 8"

MC 8"

MC 8"

MC 8"

AIR SIDE

GAS SIDE

AIR SIDE

GAS SIDE

UNIT 7B AIR HEATERS

ECONO-MIZER

REHEAT FURNACE

UNIT 7B BOILER

HP SERVICE WATER GAS SIDE WASH DWG.

HP SERVICE WATER SLOPE WASH DWG.

DWG. NO. 5082ME3005

REV. C

Electronic Filing: Received, Clerk's Office 10/31/2022

EQUIP. TAG NO.	STANDARD/SPECIFICATION NO.	MECHANICAL ENGINEERING PURCHASING RECORD NO.

REVISIONS	
REV.	DESCRIPTION
A	ISSUED FOR INITIAL REVIEW George Bogdan
B	ISSUED FOR PROJECT REVIEW
C	ISSUED FOR CLIENT CONCEPT REVIEW 21677 SYS. ENG. I&C ENG. COG. ENG. P.E.

UNIT 7A AIR HEATERS

GAS SIDE

AIR SIDE

GAS SIDE

MC 8"

MC 8"

UNIT 7A BOILER

ECONO-MIZER

SUPERHEAT FURNACE

MC

BLOCKED AREA IS PART OF BOTTOM ASH SYSTEM FOR DETAIL SEE DWG. ME3003-2

OVERFLOW 8"

ASH HOPPER 7A

NEW ASH HOPPER OVERFLOW TANK 5000 GALLON MATL. C.S.

THROTTLING VALVE

MC 6"

TO WASTE WATER STORAGE TANK DWG. ME3003-4 (E-7)

2 ASH HOPPER O/F PUMPS 1000 GPM @ 25' TDH.

MC 6"

INECTION TO DRAIN ASH HOPPER

TO MAIN COLLECTION TANK DWG. ME3003-3 (C-7)

CLINKER GRINDER

JET PUMP

BA- 10"

TO ASH POND DWG ME 3003-3 (C-7)

04960000203

DRAWING STATUS

PRELIMINARY

	Date
DRAWN G. Bogdan	1/12/77
CHECKED	
COG. ENGINEER	
DISCIP. MGR. APPVL.	
APPROVAL,	
APPROVAL,	
APPROVAL, PROJ.	
APPROVAL, CLIENT	

COMMONWEALTH EDISON COMPANY
WASTEWATER TREATMENT FACILITIES-WAUKEGAN

METAL CLEANING WASTE SYSTEM
PIPING & INSTRUMENT DIAGRAM

CECO. CONTRACT 802670 | CECO DWG. NO. | REV

NUS CORPORATION ROCKVILLE, MD. | DRAWING NO. 5082ME3005 | REV. C

SCALE: NONE | SHEET 1 OF 4

DWG. NO. 5082ME3005 REV C

HP SERVICE WATER
SOOT BLOWER
DWG. ME 3003-2(C3)

HP SERVICE WATER
GAS SIDE WASH
DWG. ME 3003-2(C3)

UNIT 8 BOILER

SUPERHEAT FURNACE

ECONO-MIZER

UNIT 8 AIR HEATERS

AIR SIDE | GAS SIDE

AIR SIDE | GAS SIDE

AIR SIDE | GAS SIDE

MC 8"

MC 8"

MC 8"

MC 8"

NEW CO.

MU

1½" BACKFLUSH LINE

OVERFLOW 8"

ASH HOPPER

1½"

4" CROSS CONNECTION TO

8A & 8B ASH SLUICE PUMPS
DWG. ME 3003-2(C3)

AH-2½"

AH 2½"

AH 6"

CLINKER GRINDER

AH 6"

BA 10"

JET PUMP

04960000204

Electronic Filing Received Clerk's Office 10/31/2022

PARTS LIST					
REF	ITEM	DESCRIPTION	REQ'D	IDENTIFICATION	
				MATERIAL	PART NO. OR SPECIFICATION

REVISIONS	
REV.	DESCRIPTION
A	ISSUED FOR INITIAL REVIEW George Bigelow
B	ISSUED FOR PROJECT REVIEW M.T. Lalman 2/16/77
C	ISSUED FOR CLIENT CONCEPT REVIEW 2-16-77 SYS. ENG. J.R. Hamm I & C ENG. T.D. Hinton COG. ENG. J.R. Hendry P.E. L.E. Yandel

SEE EQUIPMENT SPECIFICATION LIST - DWG. ME 3005-1

E

16MC-114-N
UNITS 7 & 8 LJUNGSTROM
AIR HEATER BASKET WASH AREA

GRATING
1"X2" EXP. METAL SCREENING SECTION
ELEV. 52'-0"
20' X 20' DRAINED AREA
16MC-114-N

UNIT 8 AIR HEATERS
GAS SIDE
AIR SIDE
GAS SIDE
ECONO-MIZER
UNIT 8 BOILER
REHEAT FURNACE

MC 6"
MC 8"
MC 8"
MC

PART OF BOTTOM ASH SYSTEM FOR DETAIL SEE DWG. ME3003-2

OVERFLOW 8"
ASH HOPPER
NEW ASH HOPPER OVERFLOW TANK 5000 GALLONS MATL. C.S.
THROTTLING VALVE
MC 6"
TO WASTE WATER STORAGE TANK DWG. ME3005-4(E-7)
2 ASH HOPPER O/F PUMPS 1400 GPM @ 100' TDH
TION TO DRAIN ASH HOPPER OVERFLOW TANK
MC 6"
TO MAIN COLLECTION TANK DWG. ME3003-3(C-7)
INKER GRINDER
JET PUMP
BA 10"
TO ASH POND DWG. ME 3003 - 3(C-7)

0496C000205

DRAWING STATUS: PRELIMINARY

	Date
DRAWN G. Bigelow	1/17/77
CHECKED M.T. Kalman	2/14/77
COG. ENGINEER	
DISCIP. MGR. APPVL.	
APPROVAL	
APPROVAL	
APPROVAL, PROJ.	
APPROVAL, CLIENT	

COMMONWEALTH EDISON COMPANY
WASTEWATER TREATMENT FACILITIES-WAUKEGAN
METAL CLEANING WASTE SYSTEM
PIPING & INSTRUMENT DIAGRAM

CECO CONTRACT 802670 | CECO DWG. NO. | REV
NUS CORPORATION ROCKVILLE, MD. | DRAWING NO. 5082ME3005 | REV. C
SCALE: NONE | SHEET 2 OF 4

Electronic Filing: Received, Clerk's Office 10/31/2022

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STATE OF ILLINOIS

ENVIRONMENTAL PROTECTION AGENCY

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Signed: Leon C. Baker

ADM-1041A REV. (4/77)

0496000206

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STATE OF ILLINOIS

ENVIRONMENTAL PROTECTION AGENCY

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Signed: Leon C. Baker

ADM-1041A REV. (4/77)

0496000213

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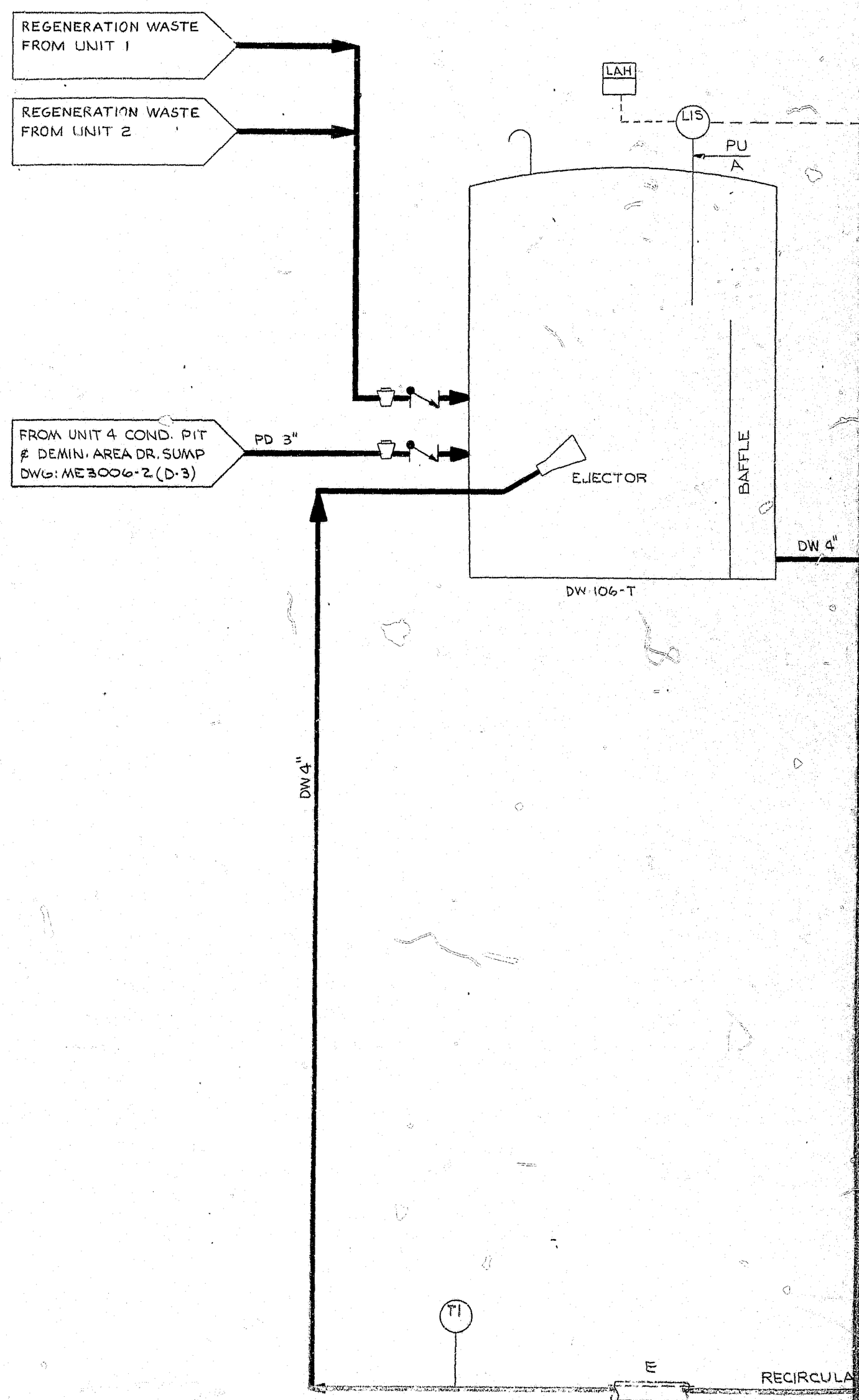
DWG. NO. 5082ME3004 REV. C

DW-106-T
EQUALIZATION TANK
CAP: 150,000 GALS.
MATL: LINED, C.S.



EQUALIZATION TANK EJECTOR
CAP: 300 GPM
MAT'L.: KYNAR

04960000214

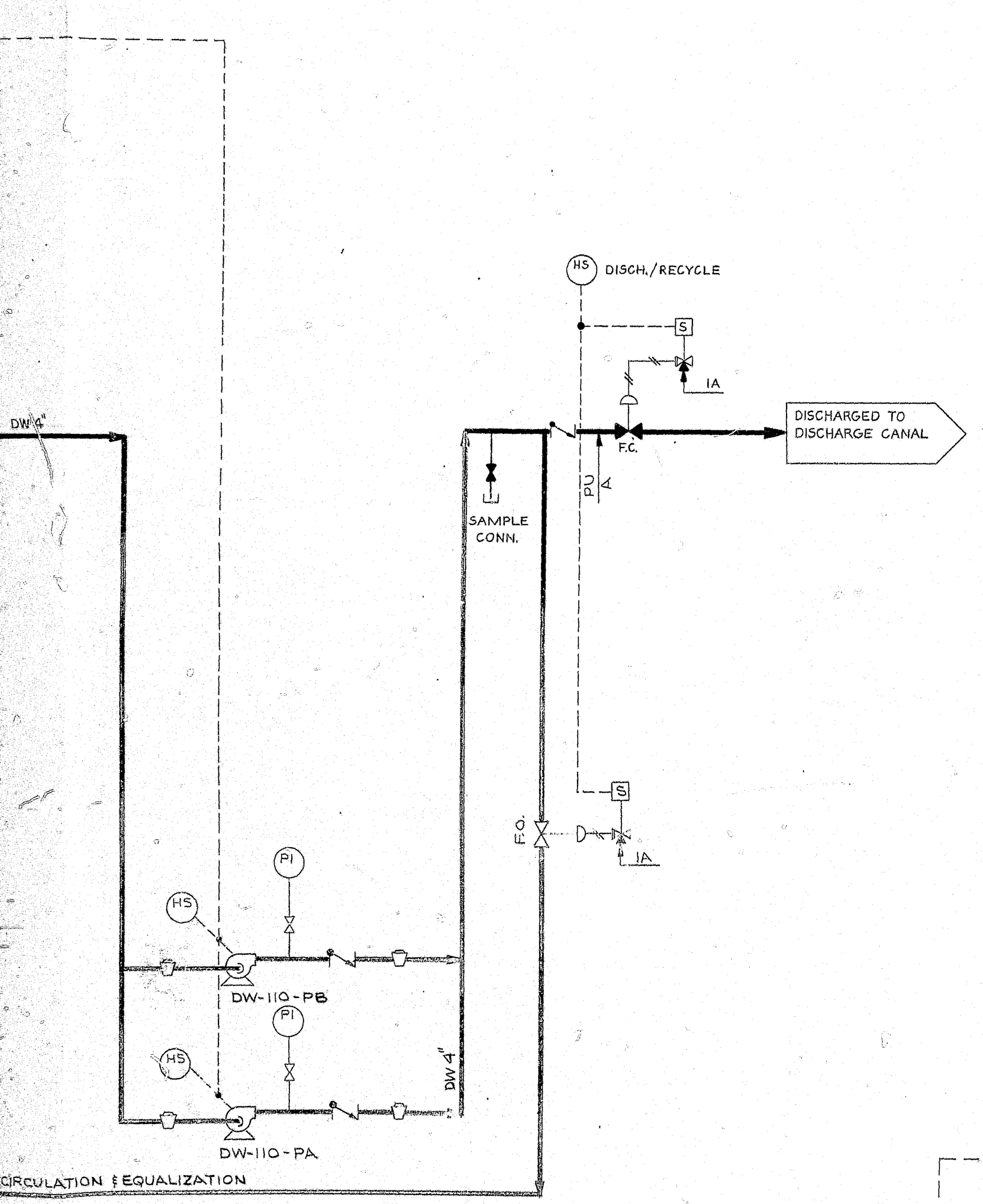
BRUNING 28010

Electronic Filing: Received, Clerk's Office 10/31/2022

PARTS LIST						
REF	ITEM	DESCRIPTION	REQ'D	IDENTIFICATION		
				MATERIAL	PART NO. OR SPECIFICATION	

EQUIPMENT SPECIFICATIONS: SEE DWG. ME3004-1

REVISIONS	
REV.	DESCRIPTION
A	ISSUED FOR INITIAL REVIEW 1-25-77 O.R. Strecker
B	ISSUED FOR PROJECT REVIEW T.R.K. 2-4-77
C	ISSUED FOR CLIENT CONCEPT REVIEW SYS. ENGR. 2-16-77 I&C ENGR. COG. ENGR. PROJ. ENGR.



DW-110-PA, DW-110-PB
EQUALIZATION DISCHARGE PUMPS
EACH CAP. 300 GPM AT 50 FT. TDH
MATL.: PVC

04960000215

DRAWING STATUS

PRELIMINARY

	Date
DRAWN O.R. Strecker	25 JAN 77
CHECKED T.R. Kruger	4 FEB 77
COG. ENGINEER	
DISCIP. MGR. APPVL.	
APPROVAL,	
APPROVAL,	
APPROVAL, PROJ.	
APPROVAL, CLIENT	

COMMONWEALTH EDISON COMPANY
WASTE WATER TREATMENT FACILITIES-WAUKEGAN

DEMINERALIZER EQUALIZATION WASTE SYS.
PIPING & INSTRUMENTATION DIAGRAM

CECO CONTRACT 802670 | CECO DWG. NO. | REV.

NUS CORPORATION ROCKVILLE, MD.

DRAWING NO. 5082ME3004 REV. C

SCALE: NONE SHEET 1 OF 1

Electronic Filing: Received, Clerk's Office 10/31/2022

DWG. NO. 5082ME3007 REV.

2½"

STEAM DRUM
UNIT 5
BOILER NO. 14
MUD DRUM
2½"
1/2"
4" DRAIN HEADER

STEAM DRUM
UNIT 5
BOILER NO. 15
MUD DRUM
2½"
1/2"
4" DRAIN HEADER

STEAM DRUM
UNIT 5
BOILER NO. 16
MUD DRUMS
2½"
1/2"
4" DRAIN HEADER

TO KINGHOLE

STEAM DRUM
UNIT 6
BOILER NO. 17
MUD DRUMS

NOTE 1

E (later) E (later) E (later)

6" H.P. DRAIN HEADER

E (later)

E (later)

E (later)

TO KINGHOLE

6"

TO ATMOS.

16HQ-118-T
UNIT 5 FLASH TANK
CAP.: 50,000 lbs./HR.
MATL: C.S.

LAH
LS
LS
PU
A
HS
3/4"
DRAIN TO FLOOR
INTERLOCK
ZS
FS
FLOAT
16HQ-131-P
UNIT 5 FLASH
CAP: 75 GPM @
MATL.: C.S.

TO ATMOS.

16HQ-119-T
UNIT 6 FLASH TANK
CAP. 50,000 lbs./HR.
MATL.: C.S.

LAH
LS
LS
PU
A
HS
3/4"
DRAIN TO FLOOR.
INTERLOCK
ZS
FS
FLOAT
16HQ-132-P
UNIT 6 FLASH T
CAP: 55 GPM @
MATL.: C.S.

04960000216

BRUNING 28010

Electronic Filing: Received, Clerk's Office 10/31/2022

PARTS LIST					
REF	ITEM	DESCRIPTION	REQ'D	IDENTIFICATION	
				MATERIAL	PART NO. OR SPECIFICATION

REVISIONS	
REV.	DESCRIPTION
A	ISSUED FOR INITIAL REVIEW 9-22-76
B	ISSUED FOR PROJECT REVIEW 10-7-76
C	ISSUED FOR CLIENT CONCEPT REVIEW 10-7-76
D	LAYOUT REDRAW, & ADDED EQUIP Nos SYS. ENGR. 2-16-77 I&C. ENGR COG. ENGR PROJ ENGR.

LAH

HS

PI

TO HIGH QUALITY WATER COLLECTION TANK DWG. ME 3007-2 (E-5)

HQ-131-P
IT 5 FLASH TANK DRAIN PUMP
P: 75 GPM @ 150 FT. TDH
TL.: C.S.

TO HIGH QUALITY WATER COLLECTION TANK DWG. ME 3007-2 (E-5)

LAH

HS

FI

TO HIGH QUALITY WATER COLLECTION TANK DWG. ME 3007-2 (E-5)

HQ-132-P
E 6 FLASH TANK DRAIN PUMP
P: 55 GPM @ 175 FT. TDH
TL.: C.S.

TO HIGH QUALITY WATER COLLECTION TANK DWG. ME 3007-2 (D-5)

04960000217

DRAWING STATUS

PRELIMINARY

		Date
DRAWN	O.R. Strahes	FEB. 77
CHECKED		2/17/77
COG. ENGINEER		
DISCIP. MGR. APPVL.		
APPROVAL,		
APPROVAL,		
APPROVAL, PROJ.		
APPROVAL, CLIENT		

COMMONWEALTH EDISON COMPANY
WASTE WATER TREATMENT FACILITIES-WAUKEGAN
HIGH QUALITY BOILER WATER REUSE SYSTEM
PIPING & INSTRUMENTATION DIAG.

CECO CONTRACT 802670 | CECO DWG. NO. | REV.

NUS CORPORATION ROCKVILLE, MD. | DRAWING NO. 5082ME3007 | REV. D

SCALE: NONE | SHEET 1 OF 2

4 3 2 1

DWG NO 5082ME3307

FROM UNIT 5
FLASH TANK
DWG ME 3007-1(D-3)

FROM UNIT 6
FLASH TANK
DWG ME 3007-1(B-3)

FROM UNIT 5
BOILERS
DWG. ME 3007-1 (D-3)

FROM UNIT 6
BOILERS
DWG. ME 3007-1 (B-3)

TO ATMOS.

STEAM DRUM
UNIT 7
BOILER
MUD DRUM

NOTE 1

16HQ-120-T
UNIT 7 FLASH TANK
CAP: 50,000 lbs./HR.
MATL: C.S.

TO KINGHOLE

6" HP DRAIN HEADER

DRAIN TO FLOOR

INTERLOCK

16HQ-133-P
UNIT 7 FLASH TANK DRAIN PUMP
CAP; 50 GPM @ 200 FT. TDH.
MATL; C.S.

FLOAT

PI

TO KINGHOLE

TO ATMOS.

STEAM DRUM
UNIT 8
BOILER
MUD DRUM

NOTE 1

16HQ-121-T
UNIT 8 FLASH TANK
CAP: 50,000 lbs./HR.
MATL: C.S.

TO KINGHOLE

6" HP DRAIN HEADER

DRAIN TO FLOOR

INTERLOCK

16HQ-134-P
UNIT 8 FLASH TANK DRAIN PUMP
CAP: 50 GPM @ 200 FT. TDH
MATL: C.S.

FLOAT

PI

TO KINGHOLE

FROM SERV WAT
DWG.

0496000218

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[S]

PARTS LIST

REF	ITEM	DESCRIPTION	QUAN	IDENTIFICATION: MATERIAL	IDENTIFICATION: PART NO OR SPECIFICATION

SEE EQUIPMENT SPECIFICATION LIST DWG. ME3007-1

REVISIONS	
C	ISSUED FOR CLIENT CONCEPT REVIEW 10-7-76
D	ADDED EQUIP. NO'S, LAYOUT REDRAW 2-15-77 SYS ENG. LDK I&C ENG. CDG. ENG. LDK P.E.

VENT

16HQ-122-T
H.Q. WATER COLLECTION TANK
CAP 310,000 GALS.
MATL: LINED C.S.

DR

SET @ (xxx) PSIG

SAMPLE CONN

16HQ-135-PA+PB
H.Q. WTR. COLL. TK. PUMPS
EACH CAP: 330 GPM @ 220 FT. TDH
MATL: C.S.

SERVICE WATER TO DISCHARGE CANAL DWG

SET @ (later) PSIG

PRESSURE TAP

FROM WELL WATER DWG.

16HQ-100-AA
H.Q. WTR. HEAT EXCH.
CAP: 50% 6x10⁶ BTU/HR.
MATL: S.S. PLATE TYPE

DRAIN TO FLOOR

SET @ (later) PSIG

16HQ-100-AB
H.Q. WTR. HEAT EXCH.
CAP: 50% 6x10⁶ BTU/HR.
MATL: S.S. PLATE TYPE

H.Q. WATER TO DEMIN. PLANT DWG.

SERV WATER

NOTES:

1. BLOWDOWN VALVE STATION TO BE RELOCATED NEXT TO FLASH TANK.
2. SYSTEM VALVE ALIGNMENT SHOWN IS FOR BOILER BLOWDOWN AND TRANSFER OF WATER FROM THE HIGH QUALITY WATER COLLECTION TANK TO THE DEMIN. PLANT.

04960000219

DRAWING STATUS: PRELIMINARY

	Date
DRAWN R. Roth	2/4/77
CHECKED T.K. Kwo	2/4/77
COG. ENGINEER	
DISCIP. MGR. APPVL.	
APPROVAL	
APPROVAL	
APPROVAL, PROJ.	
APPROVAL, CLIENT	

COMMONWEALTH EDISON COMPANY
WASTE WATER TREATMENT FACILITY WAUKEGAN
HIGH QUALITY BOILER WATER [illegible] SYSTEM
PIPING & INSTRUMENT DIAGRAM

CECO CONTRACT 80270 CECO DWG NO.

NUS CORPORATION ROCKVILLE, MD.

DRAWING NO. 5082ME3007 D

SCALE: NONE SHEET 2 of 2

Electronic Filing: Received, Clerk's Office 10/31/2022

ALL FLOOR DRAINS & SPILLS-UNITS 1 TO 4 VIA OLD DISCH. TUNNEL

16 FD-112-N
UNITS 1 THRU 4 FL. DR. SUMP
CAP: ≈ 2000 GALS.
MATL. CONCRETE

LAH LS PU A E

HS PI L.O. 16FD-137-PB

HS PI L.O. 16FD-137-PA

FD 3" later

16FD-137-PA, 16 FD-137-PB
UNITS 1 THRU 4 FL. DR. SUMP PUMPS
CAP: 250 GPM @ 50 FT. TDH
MATL: (later)

UNIT 5 BOILER ROOM DRAINS-TO BE ISOLATED FROM DISCH. TUNNEL

16FD-113-N
UNIT 5 FL. DR. SUMP
CAP: ≈ 2000 GALS.
MATL: CONCRETE

LAH LS PU A E

HS PI L.O. 16FD-138-PB

HS PI L.O. 16FD-138-PA

FD 2" later

16FD-138-PA, 16FD-138-PB
UNIT 5 FL. DR. SUMP PUMP
CAP: 50 GPM @ 50 FT. TDH
MATL: (later)

TURBINE OIL STORAGE ROOM DRAINS

TURBINE OIL STG. RM. SUMP

LAH LS HS

FD 3"

TURBINE OIL STG. RM SUMP PUMPS
CAP: 450 GPM @ 32.5 FT. TDH
5 HP. YEOMANS

UNIT 5 TURBINE ROOM DRAINS

UNIT 5 TURBINE RM. SUMP

LAH LS HS

FD 3"

TURBINE RM. SUMP PUMPS
CAP: 500 GPM @ 20 FT. TDH
5 HP. YEOMANS

UNIT 5 CRIB HOUSE

LAH LS M M

FD 4"

UNITS 5 & 6 CRIB HOUSE DRAINS

UNIT 5 CRIB HOUSE SUMP

UNIT 5 CRIB HOUSE SUMP PUMP
CAP: 100 GPM @ 100 FT. TDH
5 HP CHICAGO PUMP CO.

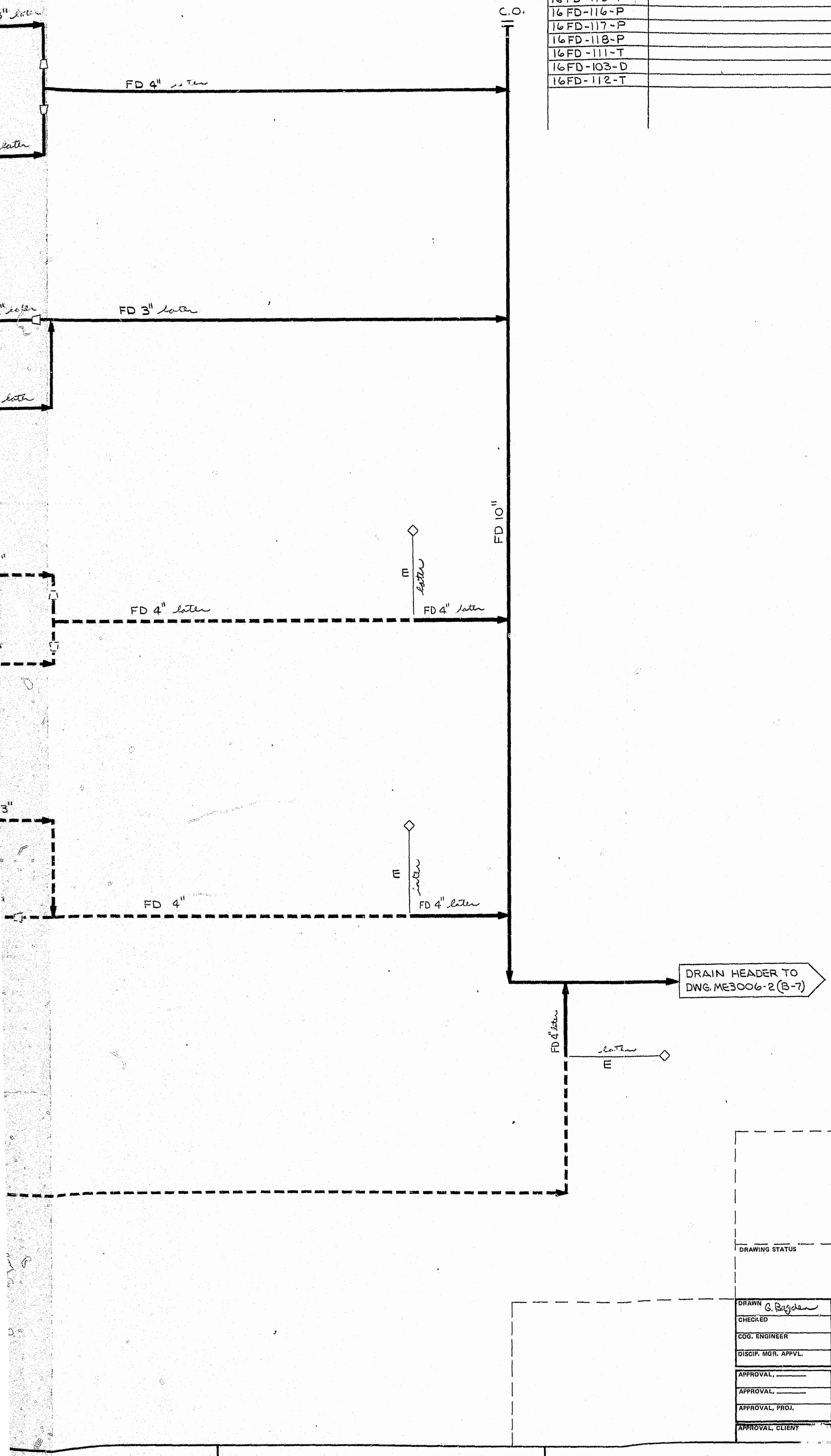
04960000220

Electronic Filing: Received, Clerk's Office 10/31/2022

Electronic Filing: Received, Clerk's Office 10/31/2022

EQUIP. TAG NO.	STANDARD/SPECIFICATION NO.	MECH. ENGR. PURCHASING RECORD NO.
16 FD-137-PA		
16FD-137-PB		
16FD-138-PA		
16FD-138-PB		
16FD-112-N		
16FD-113-N		
16FD-139-PA		
16FD-139-PB		
16FD-115-P		
16FD-116-P		
16FD-117-P		
16FD-118-P		
16FD-111-T		
16FD-103-D		
16FD-112-T		

REVISIONS	
REV.	DESCRIPTION
A	INITIAL ISSUE 2-17-77 SYS ENGR Bap I&C ENGR COG ENGR PROJ ENGR



04960000221

DRAWING STATUS

PRELIMINARY

	Date
DRAWN G. Bryden	2/15/77
CHECKED	
COG. ENGINEER	
DISCIP. MGR. APPVL.	
APPROVAL, _____	
APPROVAL, _____	
APPROVAL, PROJ.	
APPROVAL, CLIENT	

COMMONWEALTH EDISON COMPANY
WASTE WATER TREATMENT FACILITIES-WAUKEGAN
BUILDING PLUMBING & FLOOR DRAINS SYSTEM
PIPING & INSTRUMENT DIAGRAM

CECO CONTRACT 802670 | CECO DWG. No | REV.

NUS CORPORATION ROCKVILLE, MD. | DRAWING NO. 5082ME3006 | REV. A

SCALE: NONE | SHEET 1 OF 3

Electronic Filing: Received, Clerk's Office 10/31/2022

DWG. NO. 5082ME3006 REV. A

FROM UNIT 6 TURBINE RM. DRAINS

3" FD

FD 2" FD 2"

UNIT 6 TURB. RM. DRAIN SUMP

UNIT 6 TURB. RM. DR SUMP PUMPS
EACH: CAP: 100 GPM @ 100 FT. TDH
5 HP CHICAGO PUMP CO.

DEMINERALIZER AREA DRAINS & UNIT 4 CONDENSER PIT

LAH LS HS FD

UNIT 4 COND. PIT & DIMIN. AREA DR
EACH: CAP: later GPM @ later TDH

UNIT 4 COND. PIT & DIMIN. AREA DR. SUMP

UNIT 8 TURBINE ROOM DRAINS

LAH LS HS FD 3" HS FD 3"

UNIT-8 TURB. RM. DR. SUMP PUMPS
EACH: CAP: ~~100~~ later GPM @ ~~100~~ later FT TDH
7½ HP

FD 4"

UNIT 8 TURB. RM. DR. SUMP

UNIT 8 BOILER ROOM DRAINS

LAH LS PU A

HS PI FD 3" later

16FD-139-PB

16FD-139-PA

FD 3" later

16FD-139-PA, 16FD 139-PB
UNIT 8 TURB & BLR RM. DR SUMP PUMPS
EACH: CAP: later GPM @ later FT. TDH
MATL: later

UNIT 8 TURB. & BLR. RM DR SUMP

UNIT 7 TURBINE & BOILER ROOM DRAINS

LAH LS HS 2" HS 2"

3"

UNIT 7 TURB & BLR RM. DR. SUMP PUMPS
EACH: CAP: 100 GPM @ 20 FT TDH
1-HP YEOMANS

E later

FD 4" later

FD 3" later

UNIT 7 TURB. & BLR. RM. DRAIN SUMP

DRAIN HEADER FROM DWG ME3006-1 (B-2)

FD 10" later

ROOF DRAINS

HIGH ELEVATION FLOOR DRAINS

E later

RAINFALL RUN-OFF BASIN (EAST SIDE)

CAP: later GALS
MATL: later

04960000222

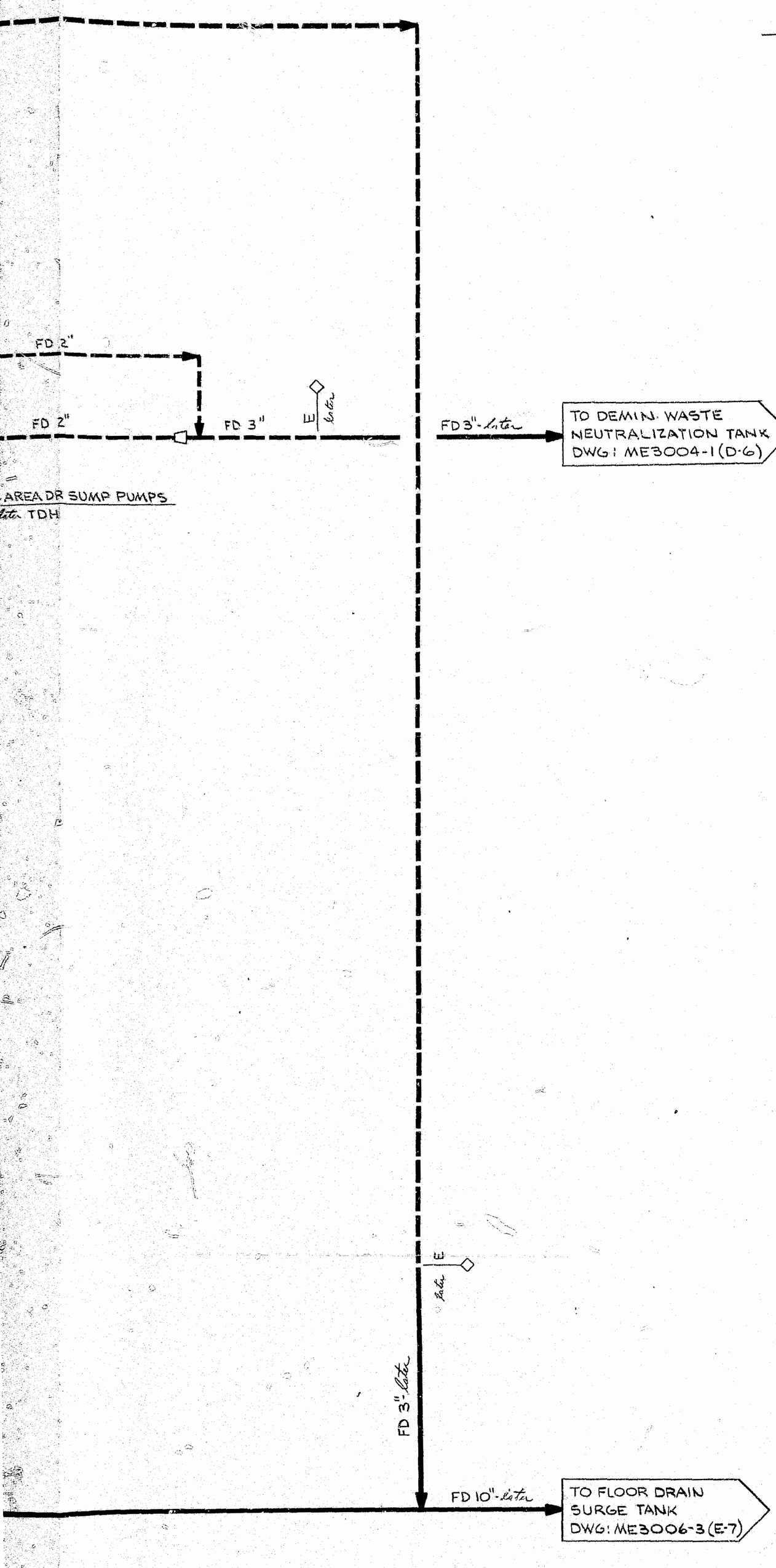
BRUNING 28010

Electronic Filing: Received, Clerk's Office 10/31/2022

PARTS LIST						
REF	ITEM	DESCRIPTION	REQ'D		IDENTIFICATION	
					MATERIAL	PART NO. OR SPECIFICATION

REVISIONS	
REV.	DESCRIPTION
A	INITIAL ISSUE. 3-17-77 SYS ENGR I&C ENGR COG ENGR PROJ ENGR

EQUIPMENT SPEC.: SEE DWG: ME3006-1



04960000223

DRAWING STATUS

PRELIMINARY

	Date
DRAWN T.R.Kung	2/15/77
CHECKED	
COG. ENGINEER	
DISCIP. MGR. APPVL.	
APPROVAL,	
APPROVAL,	
APPROVAL, PROJ.	
APPROVAL, CLIENT	

COMMONWEALTH EDISON COMPANY
WASTE WATER TREATMENT FACILITIES-WAUKEGAN

BUILDING PLUMBING & FLOOR DRAINS SYSTEM
PIPING & INSTRUMENT DIAGRAM

CECO CONTRACT NO	CECO DWG NO	REV.
802670		

NUS CORPORATION
ROCKVILLE, MD.

DRAWING NO. 5082ME3006 REV. A

SCALE: NONE SHEET 2 OF 3

Electronic Filing: Received, Clerk's Office 10/31/2022

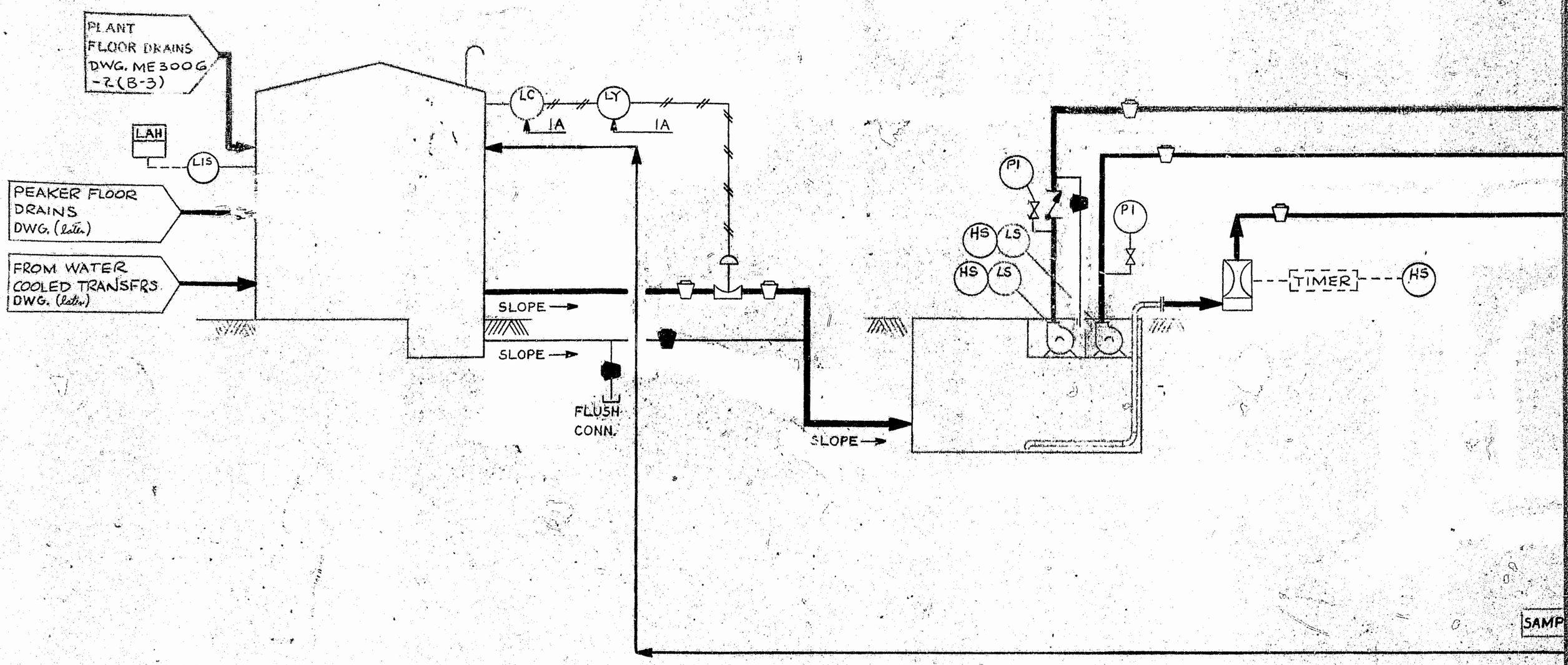
5082ME3006 DWG. NO.

16FD-111-T

FLOOR DRAIN SURGE TANK
CAPACITY: 10,000 GAL.
MAT'L. C.S.

16FD-103-D

OIL SEPARATOR
CAP. 500 GPM
MAT'L. C.S. W/FRP PLATES
TYPE: 8 PACK CORRUGATED PLATE



16FD-115-P

BUILT IN
OIL SEP.-OIL REMOVAL PUMP
CAPACITY: 25 GPM AT
25 FT. HEAD
MAT'L. C.S.

16FD-116-P

BUILT IN
OIL SEP.-WATER REMOVAL PUMP
CAPACITY= 500 GPM AT
30 - FT. HEAD
MAT'L. C.S.

16FD-117-P

OIL SEPARATOR SLUDGE PUMP
CAPACITY: 4 GPM
AT 25 FT. HEAD
MAT'L. C.S.

04960000224

Electronic Filing: Received, Clerk's Office 10/31/2022

Electronic Filing: Received, Clerk's Office 10/31/2022

PARTS LIST						
REF	ITEM	DESCRIPTION	REQ'D	IDENTIFICATION		
				MATERIAL	PART NO OR SPECIFICATION	

REVISIONS	
REV	DESCRIPTION
A	ISSUED FOR INITIAL REVIEW: G. BOGDEN 12-16-76
B	MISC. REVISIONS ISSUED FOR PROJECT REVIEW 1-5-77
C	ISSUED FOR CLIENT CONCEPT REVIEW 1-29-77
D	ADDED EQUIP NOS., CAP.& MISC. REVISIONS 2-15-77 SYS. ENGR. J.L. Hornberg ELEC. ENGR. COG. ENGR. J.K. Hendricks P.E.

SEE EQUIPMENT SPECIFICATION LIST DWG. ME3006-1

16FD-112-T

WASTE OIL SLUDGE TANK
CAPACITY: 3000 GAL.
MAT'L. C.S.

FLUSH CONNECTIONS

LAH

LIS

HS

TO TANK TRUCK
OIL TO BE HAULED
OFFSITE

FLUSH CONN.

DRAIN TO 55 GAL. DRUM

SAMPLE

TO ROOF & YARD RUN-OFF BASIN DWG. ME 3008-2 (C-7)

FE

FT

FR

LUDGE PUMP
PM

16FD-118-P

WASTE OIL SLUDGE PUMP
CAPACITY: 100 GPM
AT 25 FT. HEAD
MAT'L. C.S.

04960000225

DRAWING STATUS

PRELIMINARY

	Date
DRAWN O.R. Strecker	16 DEC. 76
CHECKED T.R. King	5 JAN. 77
COG. ENGINEER	
DISCIP. MGR. APPVL.	
APPROVAL,	
APPROVAL,	
APPROVAL, PROJ.	
APPROVAL, CLIENT	

COMMONWEALTH EDISON COMPANY
WASTEWATER TREATMENT FACILITIES - WAUKEGAN

BUILDING PLUMBING & FLOOR DRAINS
PIPING & INSTRUMENT DIAGRAM

CECO CONTRACT 802670 | CECO DWG. | REV.

NUS CORPORATION ROCKVILLE, MD.

DRAWING NO. 5082ME3006 | REV. D

SCALE NONE | SHEET 3 OF 3

STATE OF ILLINOIS

ENVIRONMENTAL PROTECTION AGENCY

The preceding 11 image(s) are partially illegible in the copy sent to be microfilmed.

The resulting microfilm may ~~be~~ illegible for use.

Signed: Leon C. Baker

ADM-1041A REV. (4/77)

0496000226

Electronic Filing: Received, Clerk's Office 10/31/2022

DWG. NO. 5082ME3008 REV. D

16CR-102-S

PACKAGED POLYMER FEED SYSTEM

16CR-103-F

OIL SKIMMER BELT TYPE PORTABLE

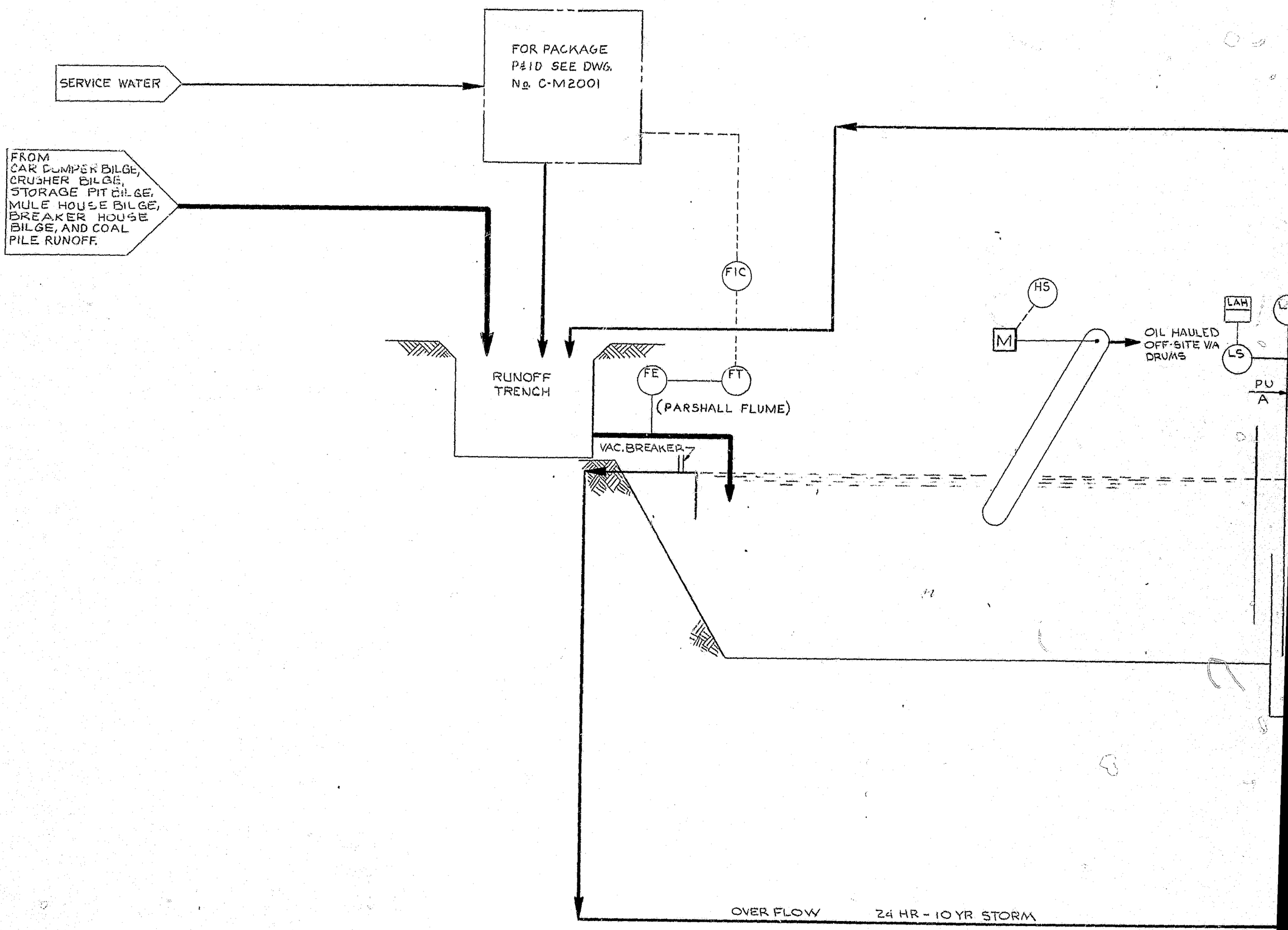
CAP: 6 BARRELS PER HR.

16CR-10

COAL PILE RUN-OFF

CAP: 1.3 ACRE

MATL: EARTH



16

DISCHARG

CAP: 500

MATL: C.S

COAL PILE RUN-OFF

04960000227

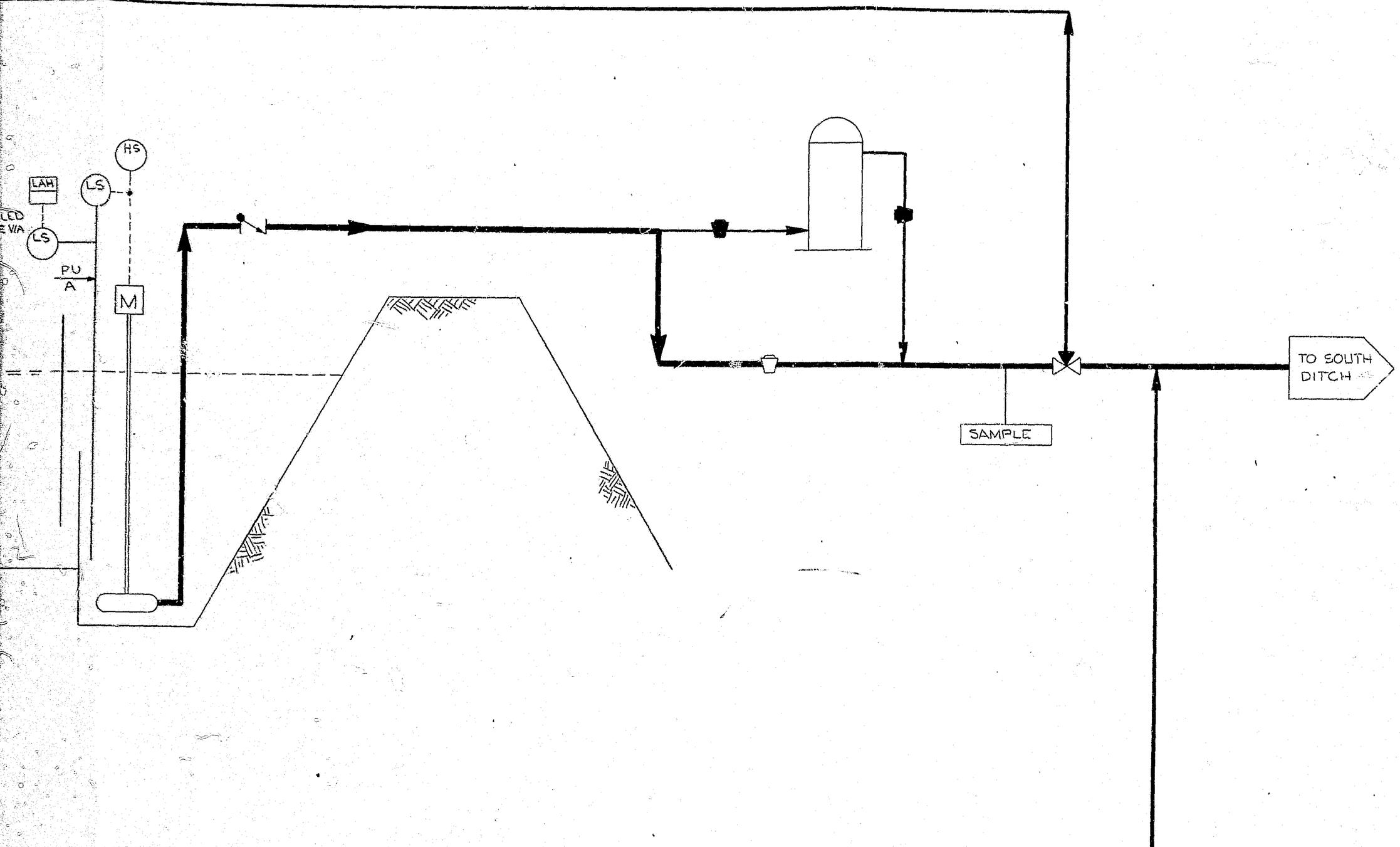
BRUNING 44-131 28010

16CR-107-N
ILE U-OFF COLLECTION BASIN
AP: ACRES, 7 FT./5 SWD
MAT: EARTHEN BASIN

16CR-104-F
FILTER
CAP: 500 GPM
MATL: C.S. DISPOSABLE CARTRIDGE TYPE

PARTS LIST						
REF	ITEM	DESCRIPTION	REQ'D	IDENTIFICATION		
				MATERIAL	PART NO. OR SPECIFICATION	

REVISIONS	
REV.	DESCRIPTION
A	ISSUED FOR INITIAL REVIEW 10-26-76 O.R.
B	MISC. REVISIONS - ISSUED FOR PROJECT REVIEW 11-9-76 PC Wh
C	ISSUED FOR CLIENT CONCEPT REVIEW 11/16/76 SYST. ENG S. Lord COGN. ENG J.R. Hamburg PROJ ENG
D	REVISED INSTRUMENTATION ADDED ASH POND DRAIN, EQUIP NO's & MISC. REVISIONS. 2-16-77 SYS. ENGR. J.R. Hamburg COG. ENGR. J.R. Hamburg I. & C. ENGR. P.E.



16CR-119-PA&PB
DISCHARGE & RECYCLE PUMP
CAP: 500 GPM, 120 FT TDH
MAT'L: C.S.

04960000228

DRAWING STATUS
PRELIMINARY

	Date
DRAWN R.P. Shoup	26 Oct 76
CHECKED PG Wh. te	11/12/76
COG. ENGINEER	
DISCIP. MGR. APPVL.	
APPROVAL,	
APPROVAL,	
APPROVAL, PROJ.	
APPROVAL, CLIENT	

COMMONWEALTH EDISON COMPANY
WASTE WATER TREATMENT FACILITIES-WAUKEGAN
COAL PILE, ROOF AND YARD RUNOFF PIPING & INSTRUMENT DIAGRAM

CECO CONTRACT 802670 | CECO DWG. NO.

NUS CORPORATION ROCKVILLE, MD.

DRAWING NO. 5082 ME 3008 | REV. D

SCALE: NONE | SHEET 1 OF 1

STATE OF ILLINOIS

ENVIRONMENTAL PROTECTION AGENCY

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The resulting microfilm may be illegible for use.

Signed: Leon C. Baker

ADM-1041A REV. (4/77)

0496000229

Electronic Filing: Received, Clerk's Office 10/31/2022

REV. C

DWG. NO. 5082ME3008

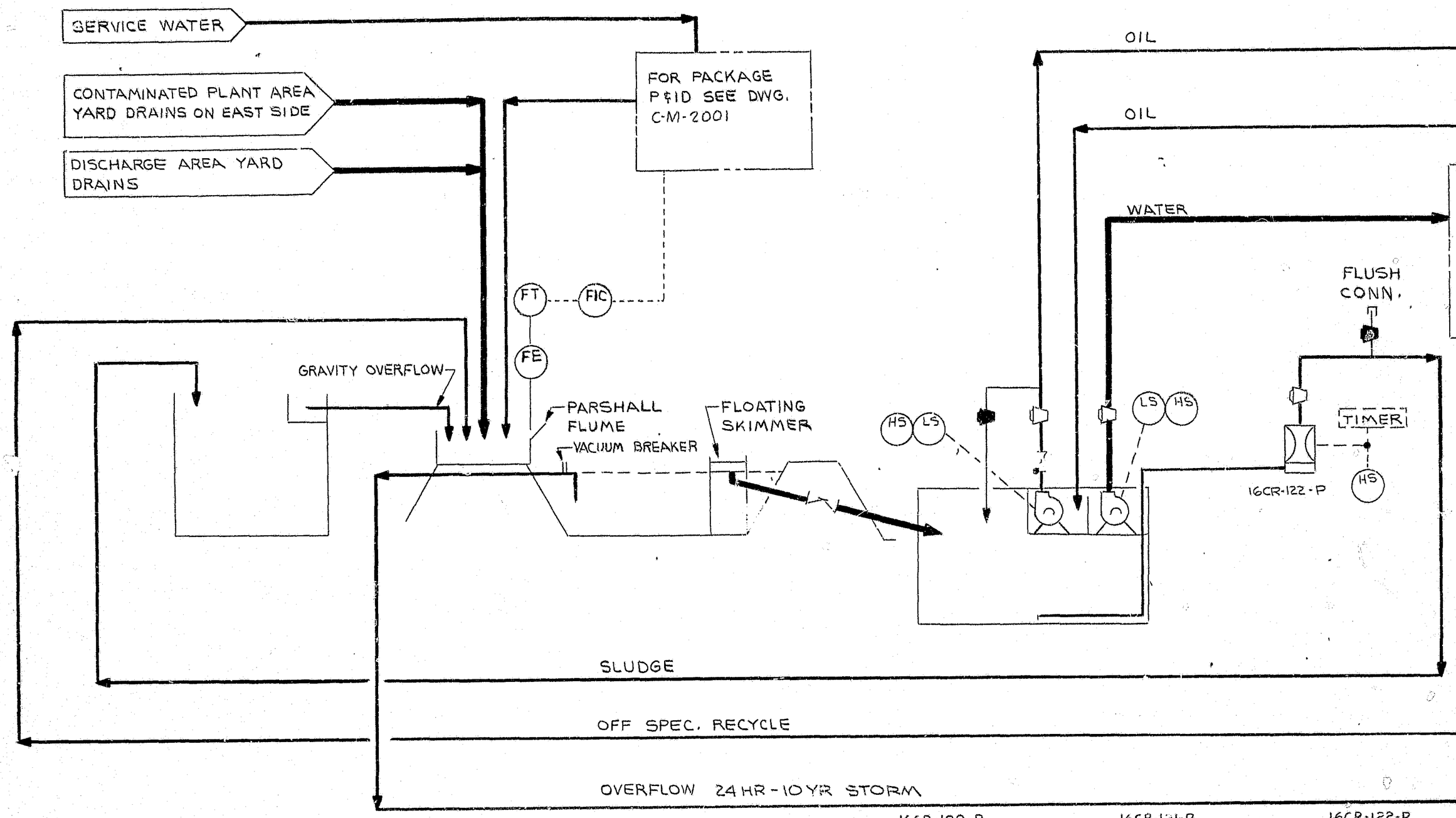
16CR-108-N
SLUDGE OIL SEPARATOR BASIN
CAP: 3740 GALS 10×10×5 DP
MATL: EARTHEN

16CR-108-N
EAST SIDE RUNOFF BASIN
CAP: 2.6 ACRES × 7' DP/5 SWD
MATL-EARTHEN

16CR 105-S
PACKAGED POLYMER
FEED SYSTEM

16'CR-104-D
CORRUGATED PLATE OIL SEPARATOR
CAP: 700 GPM
TYPE: 6 PACK
MATL: C.S. W/FRP PLATES

16 CR
PACKAGED PRE-FIL
CAP: 700
MATL: C.S



ROOF & YARD RUN-OFF – EAST SIDE

16CR-120-P
OIL REMOVAL PUMP
CAP: 4 GPM @ 25 FT. TDH
MATL: C.S.

16CR-121-P
WATER REMOVAL PUMP
CAP: 200 GPM @ 120 FT. TDH
MATL: C.S.

16CR-122-P
SLUDGE PUMP
CAP: 4 GPM @ 25 FT. TDH
MATL: C.S.

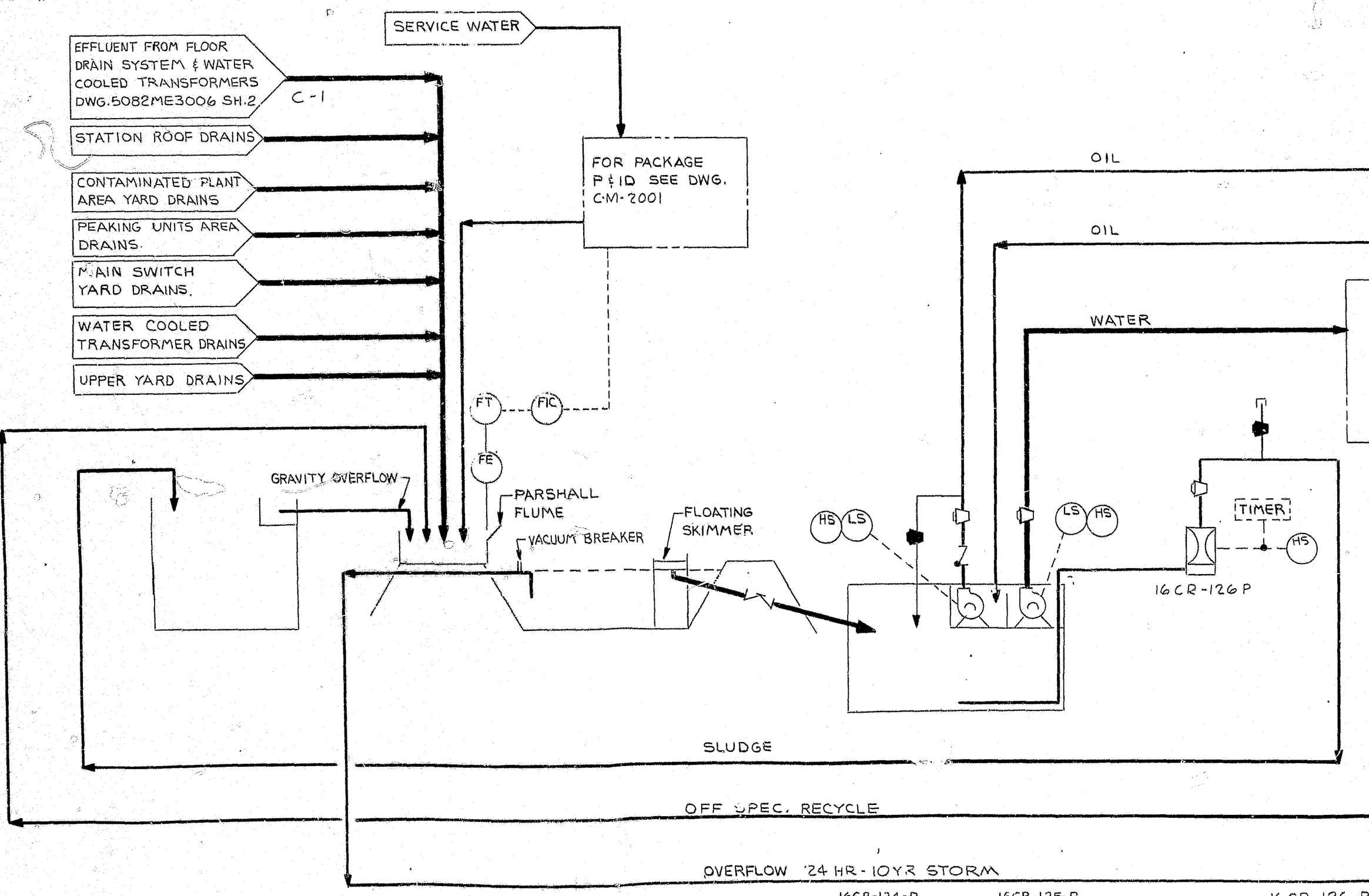
16CR-110-N
SLUDGE OIL SEPARATOR BASIN
CAP. 3740 GALS 10×10×5 DP
MAT'L EARTHEN

16CR-111-N
WEST SIDE RUN-OFF BASIN
CAP: 1.1 ACRES × 7' DP/5 SWD
MATL: EARTHEN

16 CR-106-S
PACKAGED POLYMER
FEED SYSTEM

16CR-105-P
CORRUGATED PLATE OIL SEPARATOR
CAP: 500 GPM - TYPE 6 PACK
MATL: C.S.

16CR
PACKAGED PRE-FILT
CAP: 500
MATL: C



ROOF & YARD RUN-OFF – WEST SIDE

16CR-124-P
OIL REMOVAL PUMP
CAP: 4 GPM @ 25 FT. TDH
MATL: C.S.

16CR-125-P
WATER REMOVAL PUMP
CAP: 500 GPM @ 120 FT. TDH
MATL: C.S.

16CR-126-P
SLUDGE PUMP
CAP: 4 GPM @ 25 FT.
MATL: C.S.

04960000230

BRUNING 44-131 28010

Electronic Filing: Received, Clerk's Office 10/31/2022

Electronic Filing: Received, Clerk's Office 10/31/2022

16CR-107-F
GED PRE-FILTER & OIL COALESCER SYSTEM
CAP: 700 GPM
MATL: C.S.

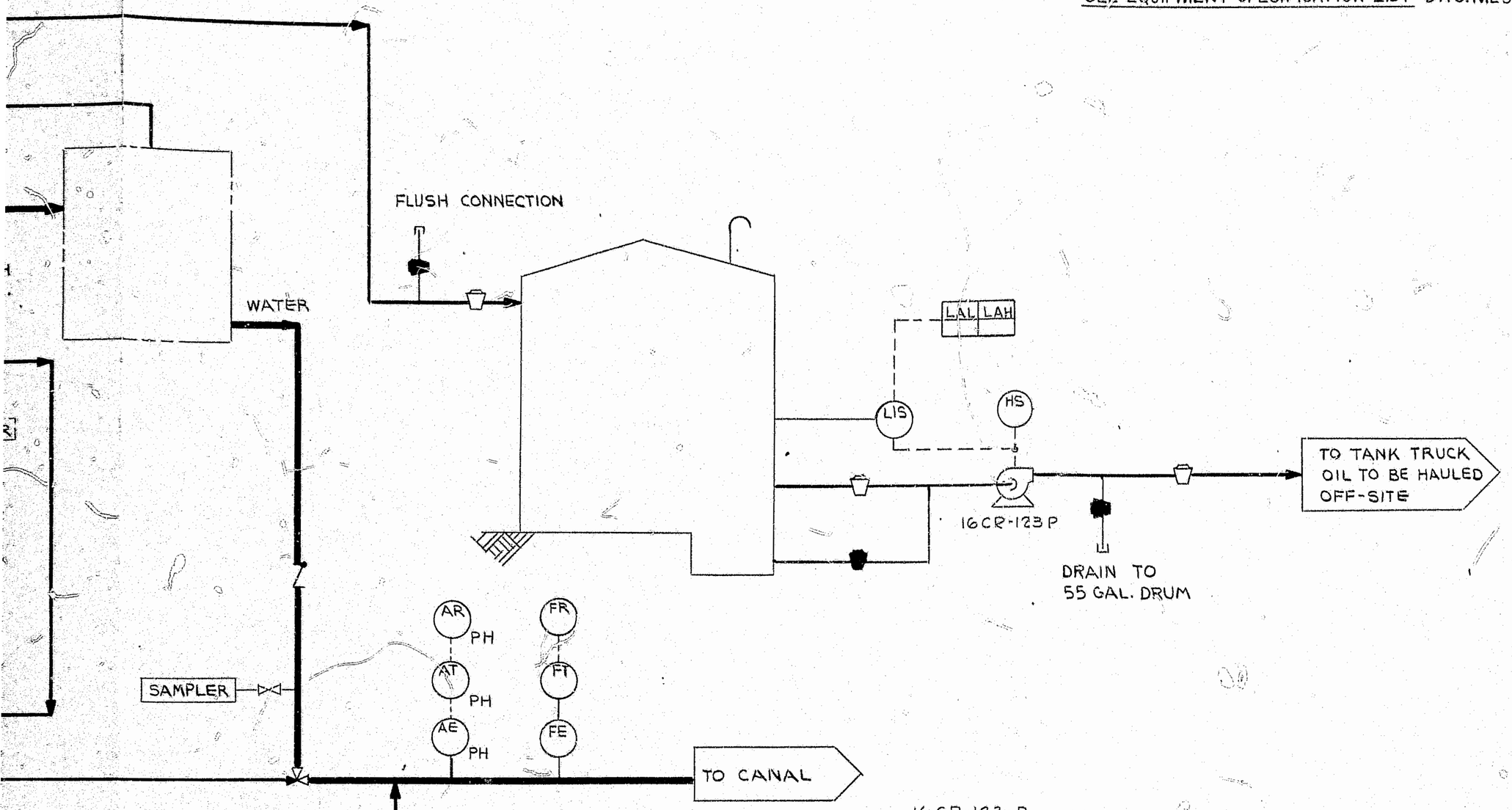
16CR-113-T
WASTE OIL SLUDGE TANK
CAP: 2000 GALLONS
MATL: C.S.

PARTS LIST

REF	ITEM	DESCRIPTION	REQ'D	IDENTIFICATION	
				MATERIAL	PART NO. OR SPECIFICATION

SEE EQUIPMENT SPECIFICATION LIST DWG. ME3008-1

REV.	DESCRIPTION
A	ISSUED FOR INITIAL REVIEW B. Bogden
B	ISSUED FOR PROJECT REVIEW PG White 11/12/76
C	ISSUED FOR CLIENT CONCEPT REVIEW 2-16-77 SYS. ENGR. JK Hanks I.C. ENGR. COG ENGR. P.E.

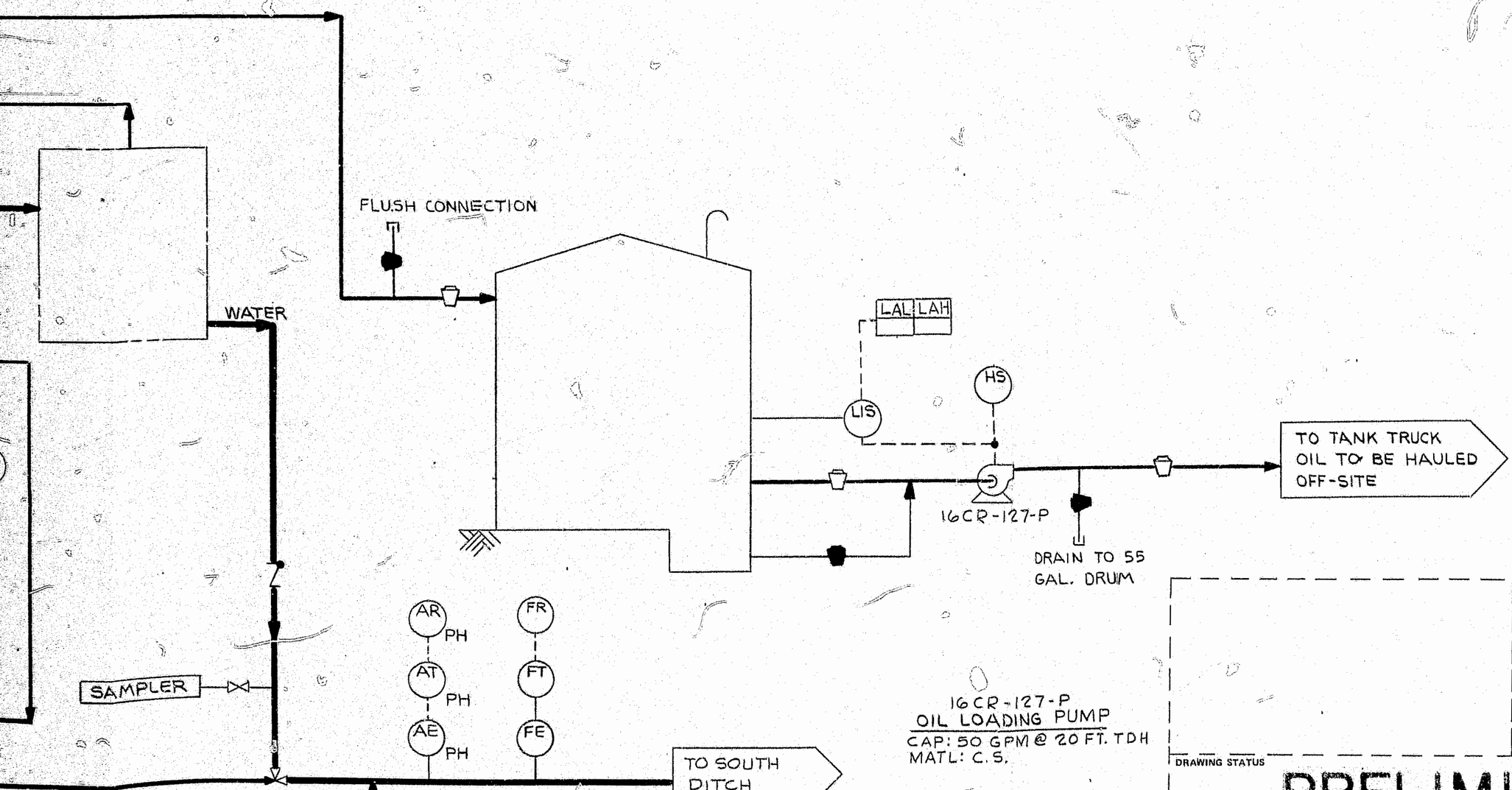


16CR-123-P
OIL LOADING PUMP
CAP: 100 GPM @ 20 FT. TDH
MATL: C.S.

-P
PUMP
25 FT TDH

16CR-108-F
ED PRE-FILTER & OIL COALESCER SYSTEM
CAP: 500 GPM
MATL: C.S.

16CR-114-T
WASTE OIL SLUDGE TANK
CAP: 1000 GALLONS
MATL: C.S.



16CR-127-P
OIL LOADING PUMP
CAP: 50 GPM @ 20 FT. TDH
MATL: C.S.

-126-P
GE PUMP
M @ 25 FT. TDH
S.

04960000231

DRAWING STATUS
PRELIMINARY

	Date
DRAWN G. Bogden	10/28/76
CHECKED PG White	11/12/76
COG. ENGINEER	
DISCIP. MGR. APPVL.	
APPROVAL,	
APPROVAL,	
APPROVAL, PROJ.	
APPROVAL, CLIENT	

COMMONWEALTH EDISON COMPANY
WASTEWATER TREATMENT FACILITIES-WAUKEGAN
COAL PILE, ROOF & YARD RUN-OFF
PIPING & INSTRUMENT DIAGRAM

CECO CONTRACT 802670 | CECO DWG. No.

NUS CORPORATION
ROCKVILLE, MD.

DRAWING NO. 5082ME3008 REV. C

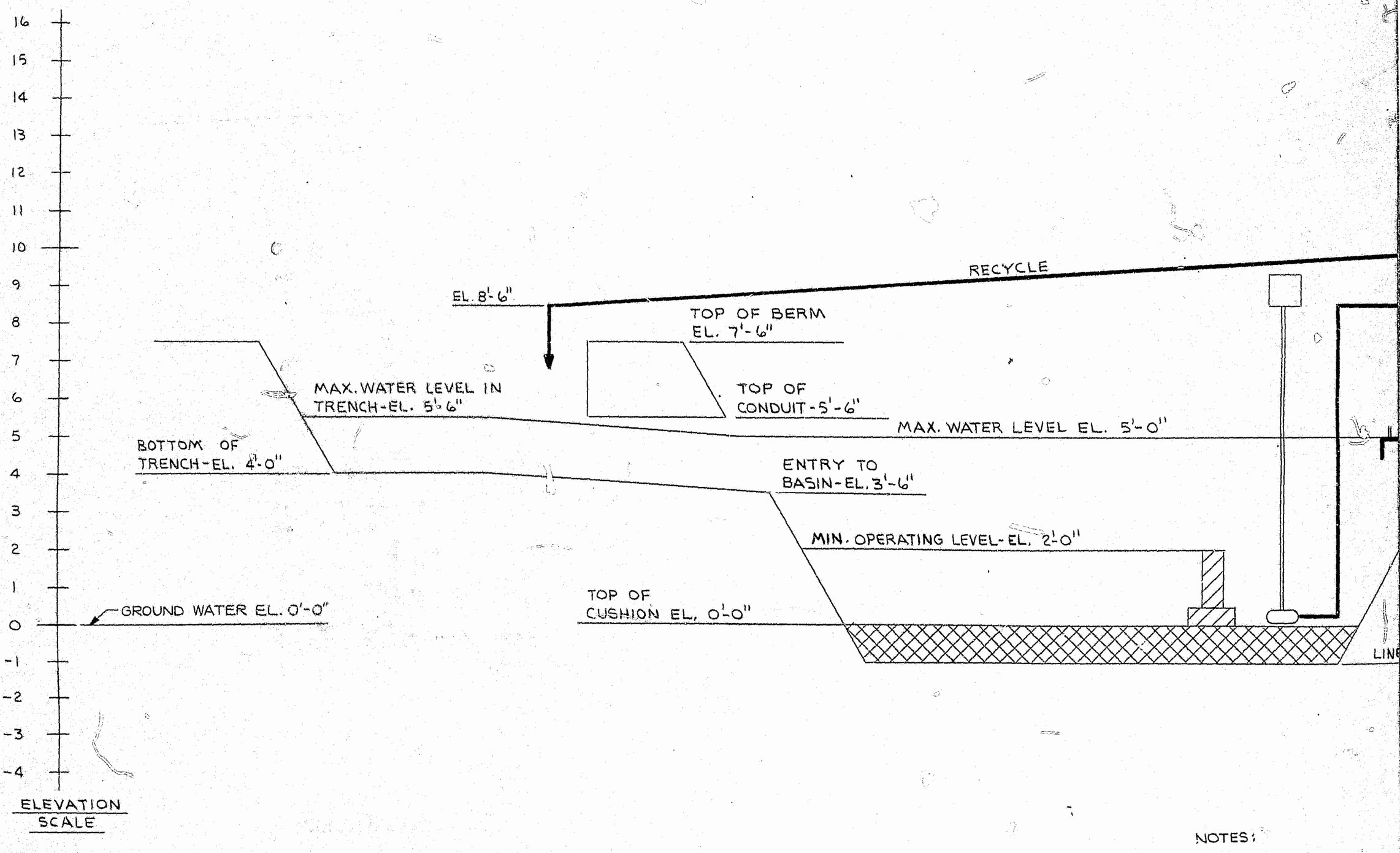
SCALE: NONE | SHEET 2 OF 2

Electronic Filing: Received, Clerk's Office 10/31/2022

DWG. NO. 5082ME3020

REV. D

PARSHALL FLUME | CONDUIT & DISTRIBUTION TROUGH | COAL PILE RUNOFF BASIN | OUTLET WEIR | SUMP PUMP



NOTES:

1) LOCATE OVERFLOW

2) THE ELEVATION SH
TO CONVERT TO

04960000232

BRUNING 44-131 28010

Electronic Filing: Received, Clerk's Office 10/31/2022

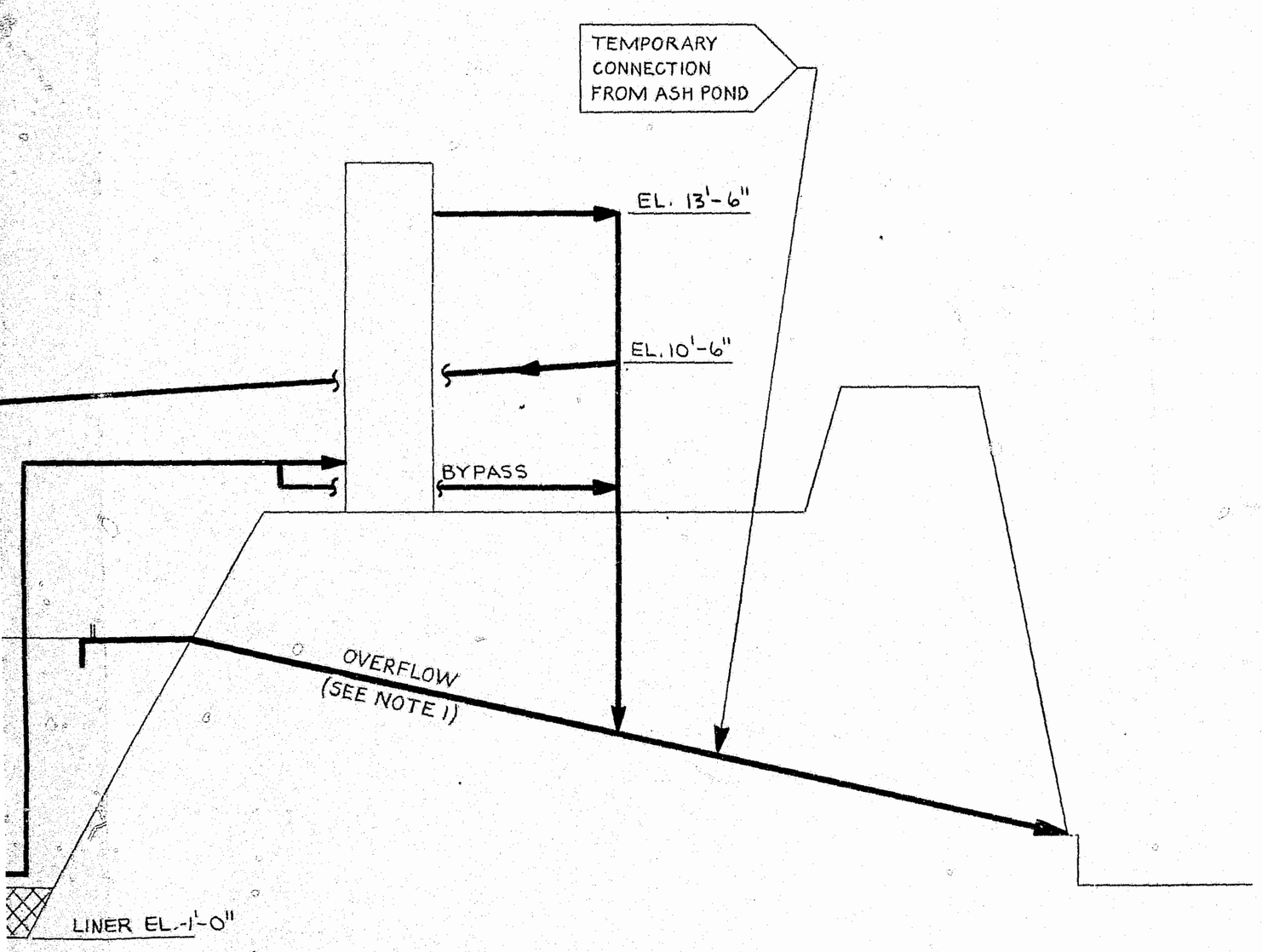
PARTS LIST						
REF	ITEM	DESCRIPTION	REQ'D	IDENTIFICATION		
				MATERIAL	PART NO. OR SPECIFICATION	

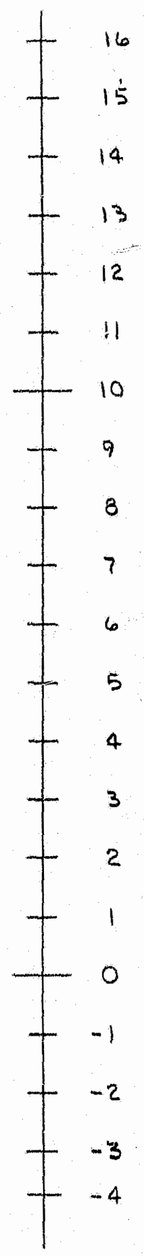
REVISIONS	
REV.	DESCRIPTION
A	ISSUED FOR INITIAL REVIEW G. Bogdan 12/9/76
B	ISSUED FOR PROJECT REVIEW T.R. Kuo 12-21-76
C	ISSUED FOR CLIENT CONCEPT REVIEW 1/5/76 SYS. ENGR. J.D. Kuo CIVIL SYS. ENGR. T.R. Kuo COG. ENGR. J.R. Hamburg PROJ. ENGR. E.L. Dunn
D	REVISED DATUM ADDED ASH POND CONN. TO C.P.R. BASIN O/F LINE & CONTINUED O/F LINE TO LAKE O.R. Strasken 1-14-77

MP PUMP

FILTER

LAKE





OVERFLOW NEAR INLET.

VATION SHOWN HEREON REFER TO WAUKEGAN CITY DATUM.
VERT TO MEAN SEA LEVEL ADD 580.564 FT.

04960000233

DRAWING STATUS

PRELIMINARY

	Date
DRAWN G. Bogdan	12/9/76
CHECKED T.R. Kuo	12/21/76
COG. ENGINEER	
DISCIP. MGR. APPVL.	
APPROVAL,	
APPROVAL,	
APPROVAL, PROJ.	
APPROVAL, CLIENT	

COMMONWEALTH EDISON COMPANY
WASTE WATER TREATMENT FACILITIES - WAUKEGAN
COAL PILE, ROOF & YARD RUN-OFF
HYDRAULIC PROFILE

CECO. CONTRACT. 802670 | CECO DWG. NO | REV.

NUS CORPORATION ROCKVILLE, MD. | DRAWING NO. 5082ME3020 | REV. D

SCALE: NONE | SHEET 1 OF 2

Electronic Filing: Received, Clerk's Office 10/31/2022

STATE OF ILLINOIS

ENVIRONMENTAL PROTECTION AGENCY

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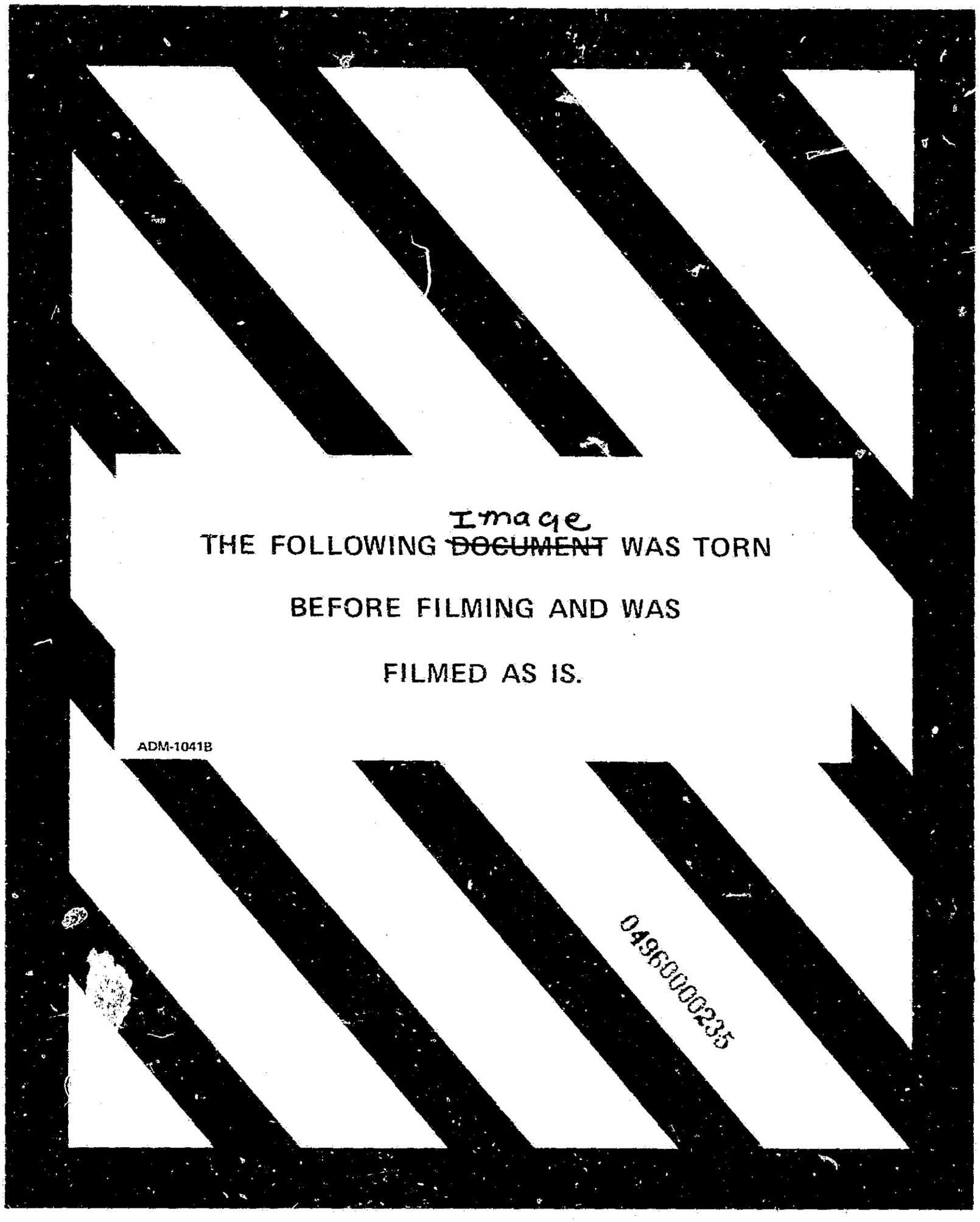
Signed: Leon C. Baker

ADM-1041A REV. (4/77)

0496000234

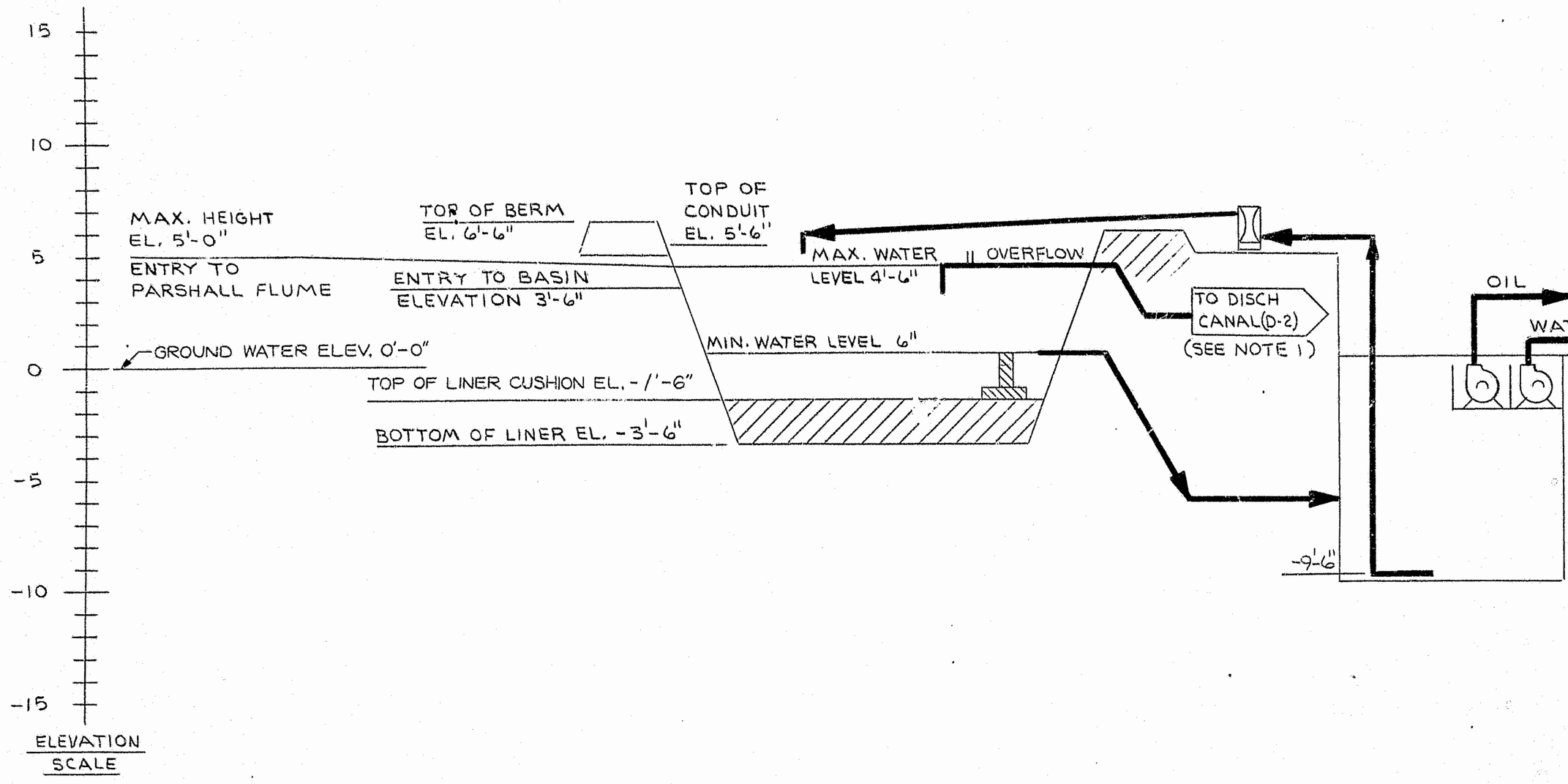
Electronic Filing: Received, Clerk's Office 10/31/2022



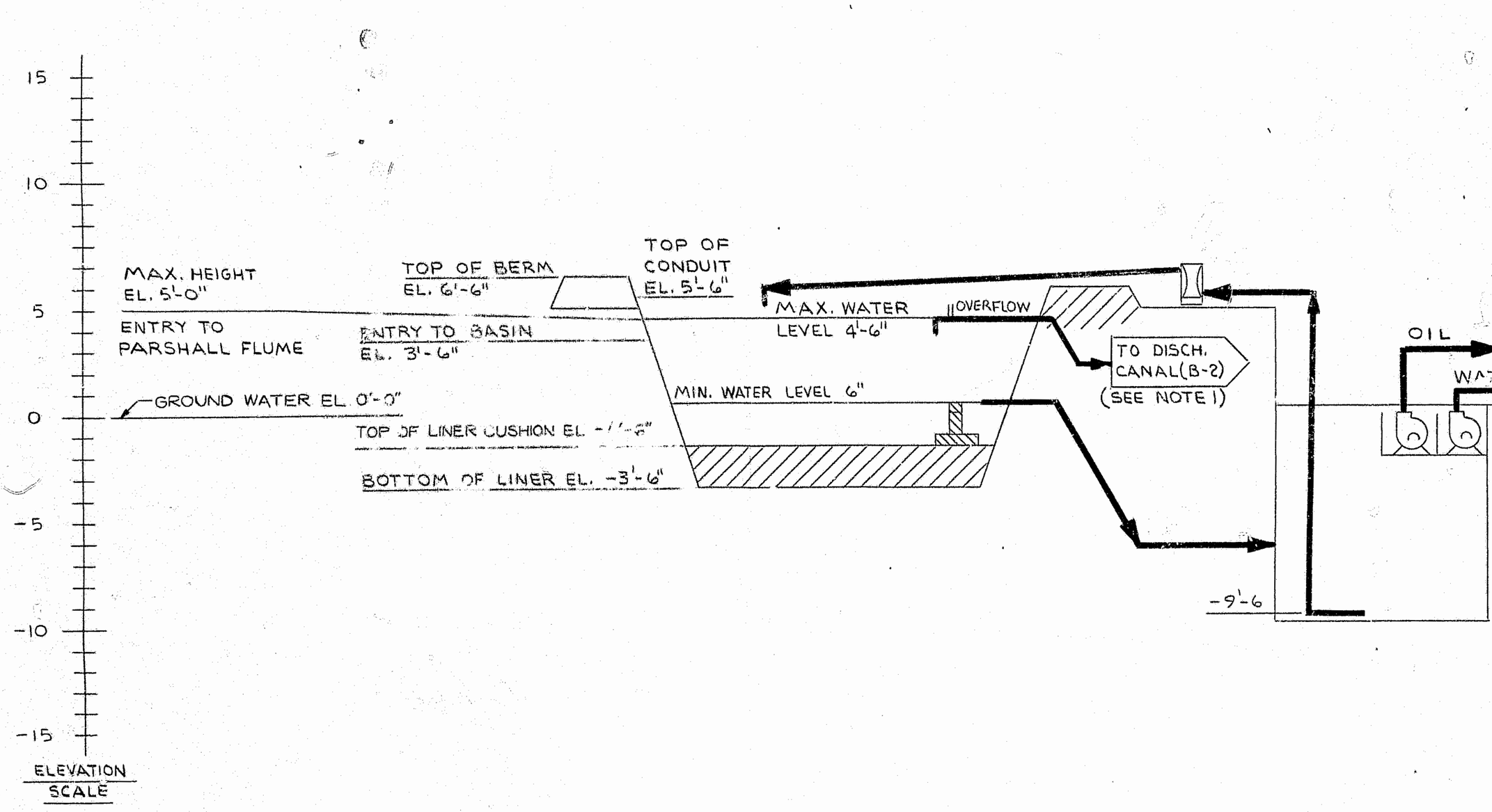
Electronic Filing: Received, Clerk's Office 10/30/2008

DWG. NO. 5082ME3020 REV. D

PARSHALL FLUME | EAST SIDE RUN-OFF BASIN | SLUDGE PUMP | OIL SEPARATOR | PR



PARSHALL FLUME | WEST SIDE RUN-OFF BASIN | SLUDGE PUMP | OIL SEPARATOR | PR



~~04960000235~~

04960[illegible]236

~~04960000234~~

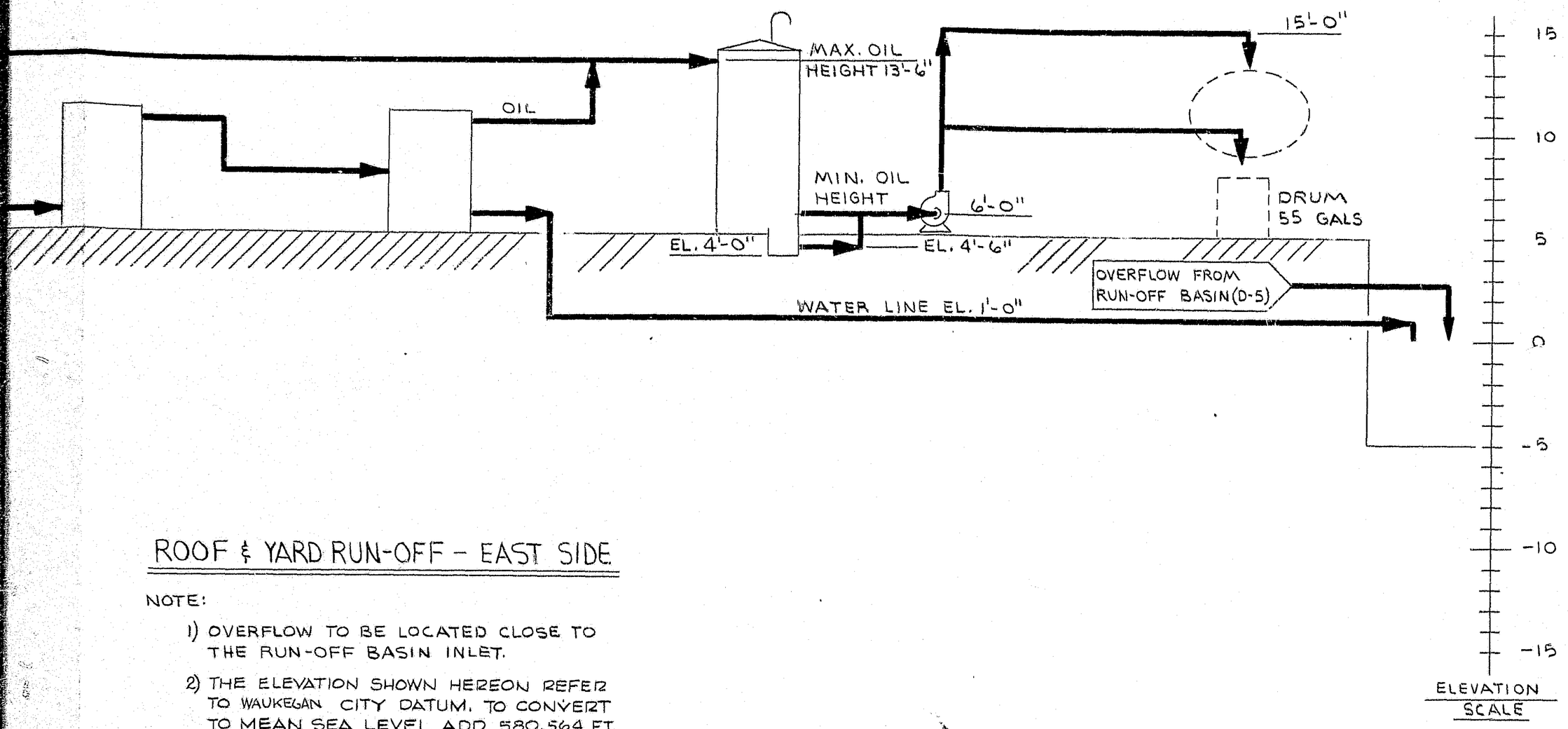
BRUNING 44-131 28010

Electronic Filing: Received, Clerk's Office 10/31/2022
[S]

Electronic Filing: Received, Clerk's Office 10/31/2022

PARTS LIST						
REF	ITEM	DESCRIPTION	REQ'D	IDENTIFICATION		
				MATERIAL	PART NO. OR SPECIFICATION	

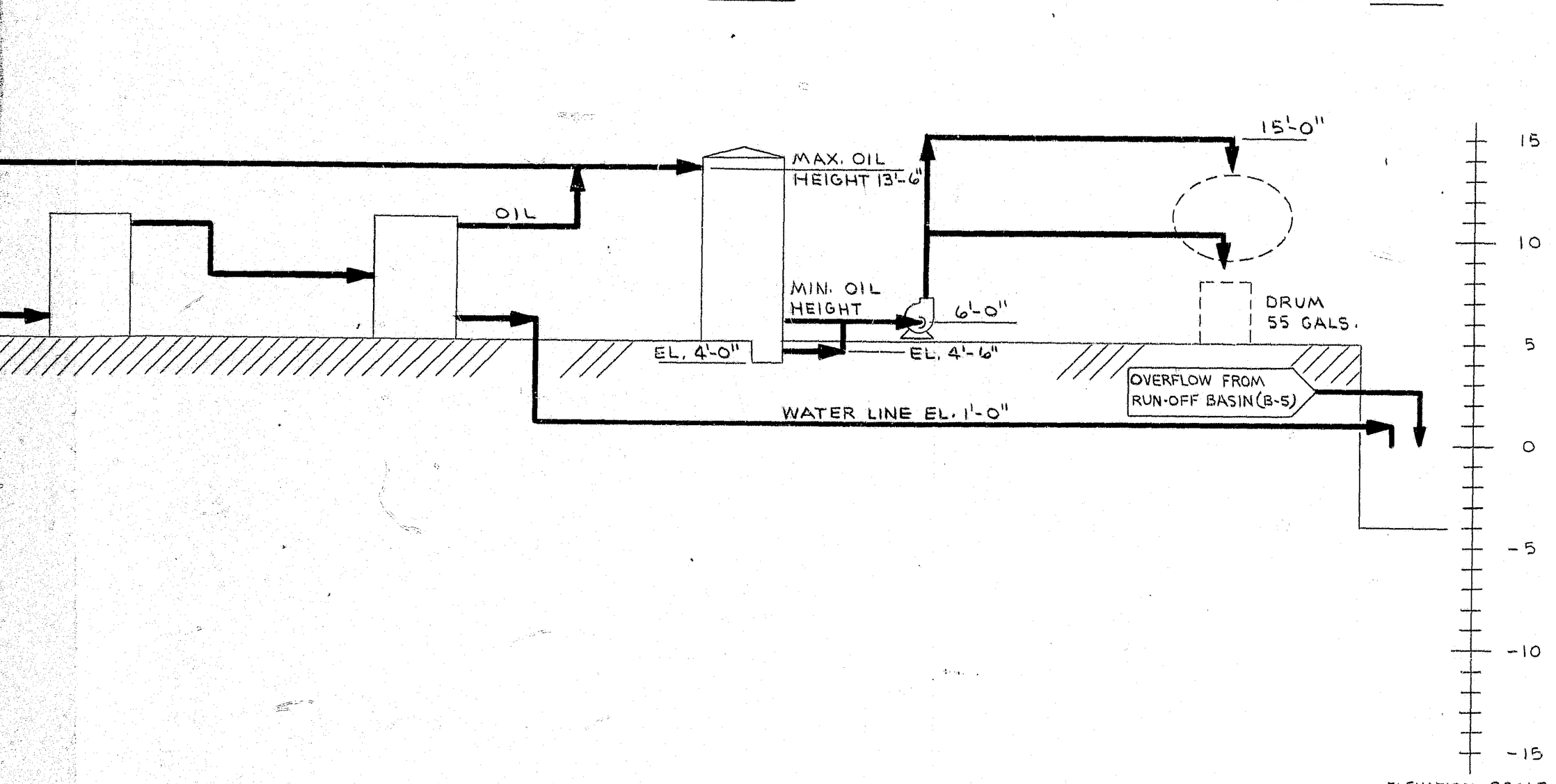
REVISIONS	
REV.	DESCRIPTION
A	ISSUED FOR INITIAL REVIEW T.R. Kunz 12-21-76
B	ISSUED FOR PROJECT REVIEW T.R. Kunz 12-21-76
C	ISSUED FOR CLIENT CONCEPT REVIEW 1/5/77 SYS. ENGR. D.C. Wagner CIVIL SYS. ENGR T. Kunz COG ENGR J.R. Hamburg PROJ. ENGR.
D	REVISED DATUM. T.R.K. 1-13-77



ROOF & YARD RUN-OFF - EAST SIDE

NOTE:

1) OVERFLOW TO BE LOCATED CLOSE TO THE RUN-OFF BASIN INLET.
2) THE ELEVATION SHOWN HEREON REFER TO WAUKEGAN CITY DATUM. TO CONVERT TO MEAN SEA LEVEL ADD 580.564 FT.



ROOF & YARD RUN-OFF - WEST SIDE

NOTE

1) OVERFLOW TO BE LOCATED CLOSE TO THE RUN-OFF BASIN INLET.
2) THE ELEVATION SHOWN HEREON REFER TO WAUKEGAN CITY DATUM. TO CONVERT TO MEAN SEA LEVEL ADD 580,564 FT.

04960000237

~~04960000236~~

~~04960000235~~

DRAWING STATUS

PRELIMINARY

	Date
DRAWN G. Bogdan	12/2/76
CHECKED T.R. Kunz	12/2/76
COG. ENGINEER	
DISCIP. MGR. APPVL.	
APPROVAL,	
APPROVAL,	
APPROVAL, PROJ.	
APPROVAL, CLIENT	

COMMONWEALTH EDISON COMPANY
WASTE WATER TREATMENT FACILITIES-WAUKEGAN

COAL PILE, ROOF & YARD RUN-OFF SYS.
HYDRAULIC PROFILE

CECO CONTRACT 802670 | CECO DWG NO | REV

NUS CORPORATION ROCKVILLE, MD.

DRAWING NO. 5082ME3020 | REV. D

SCALE: NONE | SHEET 2 OF

Electronic Filing: Received, Clerk's Office 10/31/2022

STATE OF ILLINOIS

ENVIRONMENTAL PROTECTION AGENCY

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The resulting microfilm may be illegible for use.

Signed: Leon C. Baker

ADM-1041A REV. (4/77)

0496000238

Electronic Filing: Received, Clerk's Office 10/31/2022

Exhibit

42

Electronic Filing: Received, Clerk's Office 10/31/2022

ILLINOIS ENVIRONMENTAL PROTECTION AGENCY

1021 NORTH GRAND AVENUE EAST, P.O. BOX 19276, SPRINGFIELD, ILLINOIS 62794-9276, 217-782-3397
JAMES R. THOMPSON CENTER, 100 WEST RANDOLPH, SUITE 11-300, CHICAGO, IL 60601, 312-814-6026

ROD R. BLAGOJEVICH, GOVERNOR RENEE CIPRIANO, DIRECTOR

217/782-0610

August 07, 2003

MIDWEST GENERATION
401 E GREENWOOD AVE
WAUKEGAN, IL 60087

Re: FACILITY: MIDWEST GENERATION WAUKEGAN . WAUKEGAN
NPDES Permit No: ILR108767
COUNTY: LAKE

Notice of Coverage Under Construction Stie Activity Storm Water General Permit

Dear NPDES Permittee:

We have reviewed your application and determined that storm water discharges associated with industrial activity from construction sites are appropriately covered by the attached General NPDES Permit issued by the Agency.

Your discharge is covered by this permit effective as of the date of this letter or as idenitfied by the conditions of the permit. The Permit as issued covers application requirements, a storm water pollution prevention plan and reporting requirements.

This letter shows your facility permit number below the construction site name. Please save this number and reference it in all future correspondance. Should you have any questions concerning the Permit, please contact the Permit Section at the above telephone number and address.

Very truly yours,

Toby Frevert

Toby Frevert, P.E.
Manager
Division of Water Pollution Control

TF:med:concoverage 3

Enclosure

cc: Records Unit

Region 2

ILLINOIS ENVIRONMENTAL PROTECTION AGENCY

Electronic Filing: Received, Clerk's Office 10/31/2021

NOTICE OF INTENT (NOI)

GENERAL PERMIT TO DISCHARGE STORM WATER CONSTRUCTION SITE ACTIVITIES

CK# 1179

RECEIVED
AUG 06 2003
ILLINOIS ENVIRONMENTAL PROTECTION AGENCY
BOW/WPC/PERMIT SECTION

OWNER INFORMATION

NAME: (LAST / FIRST / MIDDLE / (OR COMPANY NAME))	Midwest Generation EME, LLC			OWNER TYPE:	Private	
MAILING ADDRESS:	401 East Greenwood Avenue					
CITY:	Waukegan	STATE:	IL	ZIP:	60087	
CONTACT PERSON:	Chris Lux	TELEPHONE NUMBER: AREA CODE	847	NUMBER	599-2214	

CONTRACTOR INFORMATION

NAME: (LAST / FIRST / MIDDLE / (OR COMPANY NAME))	George J. Beemsterboer			TELEPHONE NUMBER: AREA CODE	773	NUMBER	785-6000
MAILING ADDRESS:	16807 S. Park Avenue	CITY:	South Holland	STATE:	IL	ZIP:	60473

CONSTRUCTION SITE INFORMATION

SELECT ONE:	☑ New Site ☐ CHANGE OF INFORMATION TO PERMIT NO. ILR10____														
FACILITY NAME:	Midwest Generation Waukegan Station					OTHER NPDES PERMIT NOS.:	IL0002259								
FACILITY LOCATION:	401 East Greenwood					TELEPHONE NUMBER: AREA CODE	847	NUMBER	662-6201						
CITY:	Waukegan	ST:	IL	ZIP:	60087	LATITUDE:	42	23	04	LONGITUDE:	87	48	36		
COUNTY:	Lake			SECTION:	15	TOWNSHIP:	45N			RANGE:	12E				
APPROX. CONST. START DATE:	07 / 07 / 03	APPROX. CONSTRUCTION END DATE:	10 / 01 / 03	TOTAL SIZE OF CONSTRUCTION SITE IN ACRES:	14.5										

STORM WATER POLLUTION PREVENTION PLAN COMPLETED ☑ YES ☐ NO (If no, separate notification required to Agency prior to construction.)

TYPE OF CONSTRUCTION

Industrial	TYPE BRIEF DESCRIPTION OF PROJECT: Regrading of ash pond slopes and access road and replacement of existing pond liner.

HISTORIC PRESERVATION AND ENDANGERED SPECIES COMPLIANCE

HAS THIS PROJECT SATISFIED APPLICABLE REQUIREMENTS FOR COMPLIANCE WITH ILLINOIS LAW ON:

HISTORIC PRESERVATION	☑ YES	☐ NO
ENDANGERED SPECIES	☑ YES	☐ NO

RECEIVING WATER INFORMATION

DOES YOUR STORM WATER DISCHARGE DIRECTLY TO: ☑ WATERS OF THE STATE OR ☐ STORM SEWER	OWNER OF STORM SEWER SYSTEM:
NAME OF CLOSEST RECEIVING WATER:	Lake Michigan

I certify under penalty of law that this document and all attachments were prepared under my direction and supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage this system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment. In addition, I certify that the provisions of the permit, including the development and implementation of a storm water pollution prevention plan and a monitoring program plan, will be complied with.

OWNER SIGNATURE: Bob Olney DATE: 7/1/03

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MAIL COMPLETED FORM TO: (DO NOT SUBMIT ADDITIONAL DOCUMENTATION UNLESS REQUESTED)	ILLINOIS ENVIRONMENTAL PROTECTION AGENCY DIVISION OF WATER POLLUTION CONTROL ATTN: PERMIT SECTION POST OFFICE BOX 19276 SPRINGFIELD, ILLINOIS 62794-9276 www.epa.state.il.us	LOG: PERMIT NO. ILR10 8767 DATE:

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WPC 523 Rev. 6/03

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ILR108747

MIDWEST
GENERATION LLC
An EDISON INTERNATIONAL℠ Company

RECEIVED
JUL 02 2004
ILLINOIS ENVIRONMENTAL
PROTECTION AGENCY
BOW/WPC/PERMIT SECTION

June 29, 2004

Illinois Environmental Protection Agency
Bureau of Water
1021 North Grand Avenue East
Springfield, Illinois 62704

Re: Invoice for Construction Permit

To Whom It May Concern:

We do not owe the fee for the enclosed invoice because the project has been completed and the Notice of Termination was submitted prior to July 1, 2004.

Should you require any additional information, please feel free to contact me at (847) 599-2289.

Sincerely,

Mary Connor
Environmental Health and Safety Specialist

Waukegan Generation Station
401 East Greenwood Avenue
Waukegan, IL 60087-5197
(On The Lakefront)
Tel: 847 662 6201
Fax: 847 599 2265

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RECEIVED
JUL 0 2 2004
ILLINOIS ENVIRONMENTAL PROTECTION AGENCY
BOW/WPC/PERMIT SECTION

Annual NPDES Permit Fee Billing Notice

Billing Notification for July 1, 2004 through June 30, 2005

Invoice #

Permittee

MIDWEST GENERATION
401 E GREENWOOD AVE
WAUKEGAN, IL. 60087

NPDES Permit Number ILR108767
Billing Date 5/31/2004
Payment Due 7/1/2004

Please direct any questions to the Permits Section @217-782-0610.

ILR108767 - Stormwater - Construction

Plant/Project: MIDWEST GENERATION WAUKEGAN - WAUKEGAN

#15019

NPDES Fee for 07/01/04 - 06/30/05: $500.00

Account: V000000506150

Invoice #: NPDESPERMITILR108767

Total Amount Due: $500.00

Federal Employer Identification Number (FEIN): _____

Please return this original document along with your payment in the return envelope provided. For accounting purposes please also verify/enter your Federal Employer Identification Number (FEIN). Your check or money order should be made payable to: Illinois EPA. All payments will be deposited in the Clean Water Fund.

To ensure proper credit to your account, please reference your NPDES Permit Number on your check.

Fees do not apply to the State or any department or agency of the State, nor to any school district.

Late payments shall incur an interest penalty, calculated at the rate in effect from time to time for tax delinquencies under subsection (a) of Section 1003 of the Illinois Income Tax Act, from the date the fee is due until the date the fee payment is received by the Agency.

Mail To: Illinois EPA Fiscal Services Section, Cash Receipts #2, P.O. Box 19276, Springfield, IL 62794-9276

Please use the space below to make changes to your billing address.

Preferred Billing Address:

_____
_____
_____
_____

Lien Waver Required Yes ___ No ✓
Work Order # _____
Supplier # 15019
Voucher # 35102
Date 6/7/04
IL Use Tax _____
Chicago Tax _____
Approved ENT'D JUN - 9 2004

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ILLINOIS ENVIRONMENTAL PROTECTION AGENCY

1021 NORTH GRAND AVENUE EAST, P.O. BOX 19276, SPRINGFIELD, ILLINOIS 62794-9276, 217-782-3397
JAMES R. THOMPSON CENTER, 100 WEST RANDOLPH, SUITE 11-300, CHICAGO, IL 60601, 312-814-6026

ROD R. BLAGOJEVICH, GOVERNOR RENEE CIPRIANO, DIRECTOR

217/782-0610

July 01, 2004

MIDWEST GENERATION
401 E GREENWOOD AVE
WAUKEGAN, IL 60087

Re: FACILTY: MIDWEST GENERATION WAUKEGAN WAUKEGAN
NPDES Permit No: ILR108767
COUNTY: LAKE
Termination of NPDES Construction Permit No. ILR108767

Dear NPDES Permittee:

Thank you for notifying us that construction activities at the above referenced site have ceased and that final stabilization of the site has been completed. Based on your notification, we have terminated NPDES Permit No.ILR108767 effective immediately.

If you have any questions or comments regarding the above, or if we can be of any further assistance, please contact the Permit Section at the above telephone number and address.

Very truly yours,

Alan Keller

Alan Keller, P.E.
Manager, Permit Section
Division of Water Pollution Control

AK:med:const term b

cc: Records Unit
FOS - 2
Billing System

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Q pl 03

ILLINOIS ENVIRONMENTAL PROTECTION AGENCY

NOTICE OF TERMINATION (NOT)

OF COVERAGE UNDER THE GENERAL PERMIT FOR STORM WATER DISCHARGES ASSOCIATED WITH CONSTRUCTION SITE ACTIVITIES

Please use the tab or arrow keys

OWNER INFORMATION

NAME:	LAST: Midwest Generation LLC	FIRST: EME	MIDDLE:	OWNER TYPE: PRIVATE	Private	
MAILING ADDRESS:	401 E. Greenwood Avenue					
CITY:	Waukegan			STATE: IL	ZIP: 60087	
CONTACT PERSON:	Chris Lux			TELEPHONE NUMBER:	AREA CODE: 847	NUMBER: 662-6201

CONTRACTOR INFORMATION

NAME:	LAST: Beemsterboer	FIRST: George	MIDDLE: J	TELEPHONE NUMBER:	AREA CODE: 773	NUMBER: 785-6000
MAILING ADDRESS:	16807 S. Park Avenue		CITY: South Holland		STATE: IL	ZIP: 60473

CONSTRUCTION SITE INFORMATION

8767

FACILITY NAME:	Midwest Generation- Waukegan Station			OTHER NPDES PERMIT NOS.:	I	L	0	0	0	2	2	5	9		
FACILITY LOCATION:	401 E. Greenwood Avenue														
CITY:	Waukegan	STATE:	IL	ZIP: 60087	LATITUDE:	42	23	04	LONGITUDE:	87	48	36			
COUNTY:	Lake			SECTION: 15	TOWNSHIP: 45N				RANGE: 12E						

I certify under penalty of law that disturbed soils at the identified facility have been finally stabilized or that all storm water discharges associated with industrial activity from the identified facility that are authorized by an NPDES general permit have otherwise been eliminated. I understand that by submitting this notice of termination, that I am no longer authorized to discharge storm water associated with industrial activity by the general permit, and that discharging pollutants in storm water associated with industrial activity to Waters of the State is unlawful under the Environmental Protection Act and the Clean Water Act where the discharge is not authorized by an NPDES permit.

OWNER SIGNATURE: Bobby D. Wiley DATE: Oct 3, 03

MAIL COMPLETED FORM TO:

(DO NOT SUBMIT ADDITIONAL DOCUMENTATION UNLESS REQUESTED)

ILLINOIS ENVIRONMENTAL PROTECTION AGENCY
DIVISION OF WATER POLLUTION CONTROL
ATTN: PERMIT SECTION
POST OFFICE BOX 19276
SPRINGFIELD, ILLINOIS 62794-9276

FOR OFFICE USE ONLY

LOG:
PERMIT NO. ILR10 ____
DATE:

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MIDWEST GENERATION
An EDISON INTERNATIONAL Company

Tel: 847-662-6201
Fax: 847-599-2265

FACSIMILE TRANSMISSION

To: Marilyn Davenport
Fax #: 217-782-9891

Company: IEPA
Date: 6/24/04

From: Mary Conn
Dept:

Pages: 2, including this cover sheet.

Subject: ILR 108767

COMMENTS:

NOTE: If all pages are not received, please call at: 847-599-2289

Per your telephone request regarding this NOT & the invoice we received - this project was completed on 10/3/03 & it started in July of 2003.
I can be reached at 847-599-2289.
Thanks again for your help.

THE INFORMATION CONTAINED IN THIS FAX MESSAGE IS INTENDED ONLY FOR THE PERSONAL AND CONFIDENTIAL USE OF THE DESIGNATED RECIPIENT NAMED ABOVE.

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ILLINOIS ENVIRONMENTAL PROTECTION AGENCY

NOTICE OF INTENT (NOI)

GENERAL PERMIT TO DISCHARGE STORM WATER CONSTRUCTION SITE ACTIVITIES

RECEIVED
JUL 07 2003
ILLINOIS ENVIRONMENTAL PROTECTION AGENCY
BOW/WPC/PERMIT SECTION

OWNER INFORMATION

NAME:	LAST: Midwest Generation	FIRST: EME, LLC	MIDDLE	(OR COMPANY NAME)	OWNER TYPE: Private		
MAILING ADDRESS:	401 East Greenwood Avenue						
CITY:	Waukegan			STATE: IL	ZIP: 60087		
CONTACT PERSON:	Chris Lux			TELEPHONE NUMBER:	AREA CODE: 847	NUMBER: 599-2214	

CONTRACTOR INFORMATION

NAME:	LAST: George J.	FIRST: Beemsterboer	MIDDLE	(OR COMPANY NAME)	TELEPHONE NUMBER:	AREA CODE: 773	NUMBER: 785-6000
MAILING ADDRESS:	16807 S. Park Avenue	CITY: South Holland		STATE: IL	ZIP: 60473		

CONSTRUCTION SITE INFORMATION

SELECT ONE:	☑ New Site ☐ CHANGE OF INFORMATION TO PERMIT NO. ILR10____												
FACILITY NAME:	Midwest Generation Waukegan Station				OTHER NPDES PERMIT NOS.:	IL0002259							
FACILITY LOCATION:	401 East Greenwood				TELEPHONE NUMBER:	AREA CODE: 847	NUMBER: 662-6201						
CITY:	Waukegan	ST: IL	ZIP: 60087	LATITUDE:	42	23	04	LONGITUDE:	87	48	36		
COUNTY:	Lake			SECTION:	15	TOWNSHIP: 45N		RANGE: 12E					
APPROX. CONST. START DATE:	07 / 07 / 03	APPROX. CONSTRUCTION END DATE:	10 / 01 / 03	TOTAL SIZE OF CONSTRUCTION SITE IN ACRES:	14.5								
STORM WATER POLLUTION PREVENTION PLAN COMPLETED ☑ YES ☐ NO (If no, separate notification required to Agency prior to construction.)													

TYPE OF CONSTRUCTION

Industrial (I)	TYPE BRIEF DESCRIPTION OF PROJECT: Regrading of ash pond slopes and access road and replacement of existing pond liner.

HISTORIC PRESERVATION AND ENDANGERED SPECIES COMPLIANCE

HAS THIS PROJECT SATISFIED APPLICABLE REQUIREMENTS FOR COMPLIANCE WITH ILLINOIS LAW ON:

HISTORIC PRESERVATION	☑ YES	☐ NO
ENDANGERED SPECIES	☑ YES	☐ NO

RECEIVING WATER INFORMATION

DOES YOUR STORM WATER DISCHARGE DIRECTLY TO: ☑ WATERS OF THE STATE OR ☐ STORM SEWER	OWNER OF STORM SEWER SYSTEM:
NAME OF CLOSEST RECEIVING WATER: Lake Michigan	

I certify under penalty of law that this document and all attachments were prepared under my direction and supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage this system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment. In addition, I certify that the provisions of the permit, including the development and implementation of a storm water pollution prevention plan and a monitoring program plan, will be complied with.

OWNER SIGNATURE: [signature] DATE: 7/1/03

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06/30/2003 11:59 FAX 6309932678 MOSTARDI PLATT 002

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Exhibit

43

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COMMONWEALTH EDISON COMPANY

PHASE II ENVIRONMENTAL SITE ASSESSMENT

Waukegan Generating Station
10 Greenwood Avenue
Waukegan, Illinois

ENSR
Consulting * Engineering * Remediation

November 1998
File Number 1801-023-610

MWG13-15_45779
COMP. EX. 19D

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PHASE II ENVIRONMENTAL SITE ASSESSMENT

Waukegan Generating Station
10 Greenwood Avenue
Waukegan, Illinois

November 16, 1998

Prepared for:

Commonwealth Edison Company
One First National Plaza
10 South Dearborn, 35 FNW
Chicago, Illinois 60603

Prepared by:

ENSR Corporation
740 Pasquinelli Drive
Westmont, Illinois 60559
(630) 887-1700

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MWG13-15_45781

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MWG13-15_45782

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EXECUTIVE SUMMARY

This report presents the results of the Phase II Environmental Site Assessment (Phase II ESA) conducted by ENSR Corporation (ENSR) in October 1998 at the Commonwealth Edison Company (ComEd) Waukegan Generating Station, located at 10 Greenwood Avenue in Waukegan, Illinois. Phase II ESA activities consisted of advancement of soil borings, installation of monitoring wells, and collection of surface and subsurface soil, sediment, and groundwater samples. The purpose of the Phase II ESA was to investigate the potential presence of contamination in the areas of environmental concern identified in the Phase I Environmental Site Assessment (Phase I ESA).

Based on the results of the Phase I ESA, 20 potential areas of concern were identified for further investigation. These areas of concern are identified in **Section 2.0**. Each of these areas of concern were investigated during the Phase II ESA activities. Twenty-two soil borings were advanced and 5 monitoring wells were installed. Soil samples were collected from the borings and groundwater samples were collected from the monitoring wells. In addition, 13 surface soil samples and 6 sediment samples were collected at the facility.

These samples were submitted for analysis of benzene, toluene, ethyl benzene, and total xylenes (BTEX) using EPA Method 8260; polynuclear aromatic hydrocarbons (PNAs) using EPA Method 8310; polychlorinated biphenyls (PCBs) using EPA Method 8081; Resource Conservation and Recovery Act (RCRA) metals (arsenic, barium, cadmium, chromium, lead, mercury, selenium, and silver) using EPA Method series 6000 and 7000; and pH using EPA Method 9045.

In addition, the surface soil samples and sediment samples were also submitted for analysis of total petroleum hydrocarbons (TPH) using EPA Method 8015. Water quality field parameters, consisting of pH, specific conductivity, and temperature, were also recorded from the groundwater samples collected.

PNA constituents were detected above the Illinois Environmental Protection Agency (IEPA) cleanup objectives primarily in the surface soil samples collected at the facility. These surface soil samples were collected directly from a "stained" location in the identified potential areas of concern. Therefore, it was determined that the impact from these PNA constituents is relatively localized. However, benzo(a)pyrene and dibenzo(a,h)anthracene were detected in soil samples collected from borings at approximately 4 feet below grade.

Arsenic was detected above the IEPA cleanup objective of 3 milligrams per kilogram (mg/kg) in samples collected throughout the facility. However, the majority of concentrations of arsenic are within the range of arsenic detected by the EPA during a state wide soil survey in 1992. Arsenic was detected at concentrations greater than the background range at the western wastewater collection pond, coal runoff pond, the ash settling ponds, transformers on the east side of the southern Crib House, and north of the coal pile. Analytical results from the groundwater samples collected from monitoring wells previously installed to delineate concentrations of arsenic, indicated that arsenic is present in the area adjacent to the former

MWG13-15_45783

Tannery property at concentrations above the IEPA cleanup objective of 0.2 milligrams per liter (mg/l). The Tannery property is being investigated by ComEd in cooperation with the IEPA under the Site Remediation Program.

In addition, lead was detected above the IEPA cleanup objective of 400 mg/kg in the samples collected from the western wastewater collection pond and transformers on the east side of the southern Crib House. PCBs were detected above the IEPA cleanup objective of 1 mg/kg in samples collected from the western portion of the facility adjacent to a former tannery. The PCBs were only detected in the first 4 feet of soil.

It should be noted that TPH was detected throughout the site. Although a cleanup objective has not been established by the IEPA, TPH was detected at elevated concentrations (greater than 1,000 mg/kg) and would indicate impact by petroleum hydrocarbon compounds.

Based on the relatively low volatility of the constituents of concern detected above the IEPA cleanup objectives, the soil inhalation exposure pathway is not a likely contaminant exposure pathway. In addition, due to the fact that the City of Waukegan receives its potable water from Lake Michigan and the groundwater beneath the facility is not being used as a potable source of water, the groundwater ingestion is not a potential contaminant exposure pathway. However, the soil ingestion pathway is a potential exposure pathway during construction activities. Therefore, this pathway would need to allow for protection/prevention for the construction worker scenario.

Based on the current land use (industrial) and site conditions (analytical results and soil types), it is judged that the potential for human exposure to the constituents of concern from this facility is low. It should be noted that there is no requirement under Illinois environmental law to further investigate or remediate this property.

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1.0 INTRODUCTION

1.1 General

ENSR Corporation (ENSR) was retained by Commonwealth Edison Company (ComEd) to conduct Phase II Environmental Site Assessment (Phase II ESA) activities on a "limited" portion of the 234 acre Waukegan Generating Station, located at 10 Greenwood Avenue in Waukegan, Illinois (**Figure 1**, **Site Location Map**).

The scope of the Phase II ESA activities were based on the preliminary results of the Phase I Environmental Site Assessment (Phase I ESA), with concurrence between ENSR and ComEd. Phase II ESA activities were conducted from October 26 to October 30, 1998, and included advancement of soil borings, installation of monitoring wells, and collection of surface and subsurface soil, sediment, and groundwater samples. **Figure 2** illustrates the layout of the facility.

1.2 Objectives and Scope

The purpose of the Phase II ESA was to investigate the potential presence of contamination in the areas of environmental concern identified in the Phase I ESA. The Phase II ESA adequately assessed the surface and/or subsurface conditions in the locations where sampling was conducted. The Phase II ESA is a tool for developing a conceptual site model to identify the presence and nature of potential contamination, describe potential contaminant migration pathways, and define potential exposure pathways in sampled areas. Based upon this and the information gathered during the Phase II ESA, and using the Illinois Environmental Protection Agency (IEPA) Tiered Approach to Cleanup Objectives (TACO) as guidance, it can be determined whether remediation is warranted in the locations sampled. The Phase II ESA alone is not an exhaustive investigation which can be used to determine the extent of contamination, nor the cost of any suggested remediation.

The objective of the Phase II ESA was to develop a conceptual site model to identify the presence and nature of potential contamination, describe potential contaminant migration pathways, and define potential exposure pathways. To meet this objective, ENSR implemented a "phased" assessment designed to provide increasing levels of information based upon obtained data. Recognizing that existing information for the facility and potential contamination was limited, the principal tasks completed during the Phase II ESA included the following:

- Soil boring advancement and soil sample collection;
- Monitoring well installation and groundwater sample collection;
- Collection of surface soil and sediment samples;
- Laboratory analysis of samples; and,
- Evaluation of analytical results and comparison to the IEPA Tier 1 Industrial/Commercial Soil Cleanup Objectives and IEPA Tier 1 Groundwater Cleanup Objectives.

MWG13-15_45785

The investigation consisted of the advancement of 22 soil borings and the installation of 5 monitoring wells at the potential areas of concern identified during the Phase I ESA. Soil samples were collected from the borings and groundwater samples were collected from the monitoring wells. These samples were submitted for analysis of benzene, toluene, ethyl benzene, and total xylenes (BTEX) using EPA Method 8260, polynuclear aromatic hydrocarbons (PNAs) using EPA Method 8310, polychlorinated biphenyls (PCBs) using EPA Method 8081, Resource Conservation and Recovery Act (RCRA) metals (arsenic, barium, cadmium, chromium, lead, mercury, selenium, and silver) using EPA Method series 6000 and 7000, and pH by EPA Method 9045. Water quality field parameters, consisting of pH, specific conductivity, and temperature, were also recorded from the groundwater samples collected.

In addition, 13 surface soil samples were collected from the identified potential areas of concern and 6 sediment samples were collected from selected ash/coal settling ponds or drainage ditches located at the facility. These samples were submitted for analysis of the previously referenced constituents as well as total petroleum hydrocarbons (TPH) using EPA Method 8015.

1.3 Report Organization

Section 1 introduces the principal subjects covered in this report, describes the purpose and scope of the Phase II ESA, and presents limitations of the Phase II ESA. **Section 2** provides information regarding the identified potential areas of concern and the methodologies used during the investigation. **Section 3** presents the results of the Phase II ESA. **Section 4** presents the data assessment of the Phase II ESA. **Tables** summarizing the analytical results and **Figures** illustrating the facility location and layout, as well as sampling locations, have been included under the appropriate headings.

Appendix A contains laboratory analytical reports. **Appendix B** contains boring logs and monitoring well construction diagrams. **Appendix C** contains monitoring well gauging and survey data.

1.4 Limitations

This report, including all attachments thereto, describes the results of ENSR's Phase II ESA conducted at the Waukegan Generating Station, which took place between October 26 and October 30, 1998. Many of the facts and conditions pertaining to this Phase II ESA are subject to change over time; accordingly, the evaluations and conclusions must be viewed within this context.

ENSR has performed this Phase II ESA in a professional manner using that degree of skill and care exercised for similar projects under similar conditions by reputable and competent environmental consultants. ENSR shall not be responsible for conditions or consequences arising from relevant facts that were concealed, withheld, or not fully disclosed at the time this Phase II ESA was performed.

This report and all field data, notes, and laboratory test data (hereinafter collectively "Information") were prepared by ENSR solely for the benefit of ENSR's Client, ComEd. ENSR's Client may release this Information to third parties, who may use and rely upon the Information at their own discretion. However, any use of or reliance upon this Information by a party other than parties identified shall be solely at the risk of such third party and without legal recourse against ENSR, or its subsidiaries and affiliates, or their respective employees, officers or directors, regardless of whether the action in which recovery of damages is sought is based upon contract, tort (including the sole, concurrent or other negligence and strict liability of ENSR), statute or otherwise. This Information shall not be used or relied upon by a party which does not agree to be bound by the above statement.

2.0 INVESTIGATION METHODS

Prior to initiation of field investigations, a site reconnaissance was performed during the Phase I ESA to define the study area. Field investigation activities were subsequently conducted to obtain site specific information and data pertaining to site geology and hydrogeology, groundwater quality, soil properties, and potential contaminant source(s).

The sampling locations were recommended based on the preliminary Phase I ESA findings. A sampling location summary listing is presented in **Table 1**. A summary of the identified potential areas of concern is presented below.

1. **Construction Debris Area.** An area located at the southwestern corner of the facility is used for storing construction debris. Two soil borings (B-1 and B-16) were advanced. In addition, one monitoring well (MW-11) installed during a previous site investigation of the adjacent Tannery property was discovered close to B-1.

2. **Adjacent Properties.** Properties which were located adjacent to the facility have the potential to have impacted the facility. A tannery was located to the west (upgradient) of the facility. Three soil borings (B-13 through B-15) were advanced. In addition, one monitoring well (MW-12) installed during a previous site investigation of the adjacent Tannery property was discovered close to B-15.

3. **Railroad.** A railroad line is located at the western end of the facility. Railroad lines are also located throughout the facility as part of the facility's coal handling system. One soil boring (B-12) was advanced and one monitoring well (MW-3) was installed in the northwest corner of the facility. One surface soil sample (S-1) was collected to the northwest of the construction debris area, and one surface soil sample (S-6) was collected to the south of the former Coal Car Thawing House, which is located to the south of the peaking unit building.

4. **Ash Storage Area.** The ash storage area is located one the southern end of the facility. This area is used to store ash prior to having it transported off-site. One soil boring (B-22) was advanced.

5. **Ash Settling Ponds.** There are 2 ponds at the facility which are used to collect ash wastewater. The ponds are located at the southeastern corner of the facility. One sediment sample (X-5) was collected from the western pond, and one sediment sample (X-6) was collected from the eastern pond.

6. **Coal Handling Area.** Coal is received at the facility via railroad. The coal is unloaded onto conveyors and is transported to the coal pile at the southeastern end of the facility. One soil boring (B-20) was advanced to the north of the coal pile.

7. **Coal Runoff Pond.** There is one pond at the facility which is used for runoff water from the coal pile. The pond is located to the west of the coal pile. One sediment sample (X-4) was collected and one soil boring (B-17) was collected to the west of the pond.

8. **Coal Handling Tractor Buildings.** These buildings house and maintain the coal handling tractors, and are used for the storage of various oils and lubricants. These buildings are located at the northwest end of the coal pile. One surface soil sample (S-13) was collected to the west of the Coal Handling Tractor Maintenance Building, and one surface soil sample (S-14) was collected to the east of the Coal Handling Tractor Maintenance Building.

9. **Peaking Units.** There is one peaking unit building located to the southwest of the main building. These peaking units use jet fuel to generate power. Two surface soil samples (S-4 and S-5) were collected. One soil boring (B-3) was advanced and one monitoring well (MW-2) was installed to the south of the peaking unit building.

10. **Jet Fuel Aboveground Storage Tank.** Two 300,000 gallon aboveground storage tanks (ASTs) are located to the west of the peaking unit building. These ASTs are used for the storage of jet fuel which is pumped via underground piping to the facility's peaking units. One surface soil sample (S-2) was collected adjacent to the fuel regulator building, and one surface soil sample (S-3) was collected to the south of the Pump House.

11. **Wastewater Collection Ponds.** There are 2 ponds at the facility which are used for wastewater collection. One pond is located to the west of the jet fuel ASTs and one pond is located at the northeastern corner of the facility. One sediment sample (X-1) was collected from the western pond. In addition, a drainage ditch is located adjacent to this pond. One sediment sample (X-2) was collected from this ditch. One sediment sample (X-3) was collected from the northeastern pond.

12. **Transformers.** Transformers with oil staining were observed throughout the facility. Soil samples were collected in 3 locations with the most significant staining. The first location contains the transformers on the east side of the southern Crib House, located on the west side of the main building. One surface soil sample (S-11) was collected. The second location contains the transformers to the northeast of the jet fuel ASTs. One soil boring (B-19) was advanced. The third location contains the transformers to the north of the peaking unit building. One soil boring (B-4) was advanced.

13. **Used Oil ASTs.** There are two 7,500 gallon ASTs at the facility which are used for the storage of used oil. One AST is located to the west of the western wastewater collection pond. One soil boring (B-2) was advanced. The second AST is located to the east of the northeastern wastewater collection pond. One surface soil sample (S-9) was collected.

14. **Fire Brigade Area.** A fire brigade area is located to the west of the northeastern wastewater collection pond. This area was used as an area for fire safety training. Two

soil borings (B-6 and B-7) were advanced.

15. **Materials Storage Buildings.** There are two materials storage buildings located at the facility. The storage buildings are located to the west of the fire brigade area. The concern at this storage building was drum storage at the building. One soil boring (B-8) was advanced between the two buildings.

16. **Gasoline/Diesel ASTs.** One 500 gallon gasoline AST and one 500 gallon diesel fuel AST are located to the west of the two materials storage buildings. One soil boring (B-9) was advanced. One 10,000 gallon diesel AST is located to the north of the Coal Handling Tractor Building. One soil boring (B-18) was advanced and one monitoring well (MW-5) was installed adjacent to this AST. In addition, one surface soil sample (S-15) was collected.

17. **Chimneys/Precipitators.** The chimney units are located to the east of the main building. Surface staining from the precipitator equipment was observed. One surface soil sample (S-8) was collected.

18. **Former Underground Storage Tank.** One former underground storage tank (UST) was located at the north end of the facility adjacent to the western gate house. Two soil borings (B-10 and B-11) were advanced.

19. **Former Ignition Oil Pump House.** The former ignition oil pump house was located to the southeast of the peaking unit building. Two ASTs containing ignition oil were previously located adjacent to this building. One surface soil sample (S-7) was collected.

20. **Lakeshore.** Lake Michigan is located at the eastern end of the facility. Cooling water is drawn from and returned to Lake Michigan, and the inferred groundwater flow direction is towards Lake Michigan. Soil and groundwater samples should be collected from facility downgradient locations. One soil boring (B-21) was advanced and one monitoring well (MW-6) was installed to the south of the intake/discharge flume in the northeast end of the facility. One soil boring (B-23) was advanced and one monitoring well (MW-7) was installed to the north of the intake/discharge flume in the northeast end of the facility.

It should be noted that due to heavy concentrations of buried utility lines or other underground obstructions, one planned soil boring (B-5) was not advanced. Surface soil samples were not collected at these locations due to the areas being covered with concrete/asphalt. In addition, monitoring wells, which were installed at the facility during a previous investigation, were discovered in the vicinity of proposed monitoring wells MW-1 and MW-4, and therefore not installed. However, groundwater samples were taken from these two existing monitoring wells.

2.1 Sampling Methods

All soil (surface and subsurface), sediment, and groundwater samples collected were submitted for analysis of BTEX and PNA constituents using EPA Methods 8260 and 8310, respectively,

PCBs using EPA Method 8081, RCRA metals using EPA Method series 6000 and 7000, and pH by EPA Method 9045. In addition, surface soil and sediment samples were submitted for TPH using EPA Method 8015. A sample summary listing is presented in **Table 1**.

The sample glassware used to contain the samples retained for laboratory analysis were provided pre-cleaned from National Environmental Laboratories, Inc. (NET) of Bartlett, Illinois. Each sample was labeled with the project number, project location, client, sample number, sample depth, date, time, and requested analysis. The soil samples were stored on ice in the field in a cooler and shipped via courier under chain-of-custody to NET. Standard chain-of-custody procedures were maintained from the time of sample collection until delivery to the analytical laboratory.

2.1.1 Sediment Sampling

Six sediment samples (X-1 through X-6) were collected at the facility. The sediment sample locations are illustrated on **Figure 3**. Sediment samples were collected using a stainless steel hand shovel. All sampling equipment was decontaminated between each sediment sample location using the procedure outlined in **Section 2.3**.

2.1.2 Surface Soil Sampling

Thirteen surface soil samples (S-1 through S-9, S-11, and S-13 through S-15) were collected at the facility. The surface soil sample locations are illustrated on **Figure 4**. Surface soil samples were collected using a stainless steel hand shovel. All sampling equipment was decontaminated between each sediment sample location using the procedure outlined in **Section 2.3**.

2.1.3 Soil Borings and Subsurface Soil Sampling

Twenty-two soil borings (B-1 through B-4, and B-6 through B-23) were advanced at the facility. The soil borings locations are illustrated on **Figure 5**. It should be noted that due to heavy concentrations of buried utility lines or other underground obstructions, one planned soil boring (B-5) was not advanced. The soil borings were advanced by Fox Drilling, Inc. (Fox) of Itasca, Illinois, utilizing Geoprobe direct-push drilling techniques. The soil borings were advanced to a maximum depth of 8 feet below grade. All soil borings were backfilled with soil cuttings, and completed at surface grade with the appropriate material (i.e., concrete, asphalt). All sampling equipment was decontaminated between each soil boring location using the procedure outlined in **Section 2.3**.

Soil samples were collected by advancing by a hydraulically-driven stainless steel pre-probe. Soil samples were collected using a 2.0-inch diameter acetate lined soil sampler. Soil samples were continuously collected from the surface to the bottom of the soil borings. The soil samples were visually inspected and field classified using the general guidelines of the Unified Soil Classification System (USCS) and the American Society for Testing and Materials (ASTM) Test Method ASTM D2488 for soil classification.

Each soil sample was field screened for the presence of VOCs using a photoionization detector (PID) and standard headspace screening methods. The PID readings indicate relative levels of VOCs in the vapor headspace, but do not represent actual concentrations which may exist in the soil. The PID has a detection range of 1.0 part per million volume (ppmv) to 2,500 ppmv. The soil sample which exhibited the highest PID reading, or if no PID readings were detected, from directly above the field-interpreted groundwater level, was retained from each boring for laboratory analysis.

2.1.4 Monitoring Wells and Groundwater Sampling

Five monitoring wells (MW-2, MW-3, and MW-5 through MW-7) were installed at the facility. The monitoring well locations are illustrated on **Figure 5**. It should be noted that monitoring wells MW-1 and MW-4 were not installed due to the discovery of monitoring wells MW-11 and MW-12, which were installed at the facility during a previous investigation. The monitoring wells were installed by Fox utilizing hollow-stem augers and rotary drilling techniques. The monitoring wells were installed to a maximum depth of 15 feet below grade. Fluids generated during monitoring well installation and groundwater sampling were discharged to the ground surface in proximity to each sampling location. All sampling equipment was decontaminated between each soil boring location using the procedure outlined in **Section 2.3**.

The monitoring wells were installed through the working space within hollow stem augers. The monitoring wells were constructed of 2-inch diameter Schedule 40 PVC 0.010-inch slotted continuous wrap well screen and solid riser. A filter pack consisting of clean silica sand was placed surrounding the well screen to filter out fine soil particles from the formation adjacent to the screen. The filter pack extends from the bottom of the soil boring to approximately 1-foot above the top of the well screen. A bentonite pellet seal was placed on top of the sand pack and hydrated with distilled water to prevent surface water infiltration. The annular space above the bentonite seal was filled with a neat bentonite and cement grout to approximately 6-inches below grade. The monitoring wells were completed at grade and an 8-inch diameter steel protective road box was placed over each monitoring well and set in concrete at grade. The monitoring wells were capped with expandable well caps and equipped with locks to prevent unauthorized access. A monitoring well construction diagram is included in **Appendix A**.

After the installation of the monitoring wells, approximately three to five well volumes of groundwater was removed from each monitoring well, or until the groundwater was relatively free from sediment, using a peristaltic pump. One groundwater sample was collected from each monitoring well and submitted for laboratory analysis. In addition, water quality field parameters consisting of pH, specific conductivity, and temperature were measured and recorded during sample collection.

2.2 Monitoring Well Gauging and Survey

Each monitoring well was gauged using an electronic interface probe in order to determine the presence or absence of liquid-phase hydrocarbons (LPHCs) and depth to groundwater. In addition, each monitoring well's top of casing and ground surface location was surveyed relative to an arbitrary benchmark assigned an elevation of 100 feet.

2.3 Equipment Decontamination

The drill rig and associated tooling, and sampling equipment were decontaminated prior to mobilization and before leaving the site. To minimize the potential for cross-contamination, drilling and sampling equipment were decontaminated between each use. Decontamination of drilling equipment consisted of steam cleaning. Sampling equipment, including split spoons and stainless steel sampling equipment, were decontaminated before each use by washing with a solution of Alconox (phosphate based detergent) and potable water, and rinsing with distilled water. Decontamination fluids generated during equipment decontamination were discharged to the ground surface in proximity to each sampling location.

3.0 INVESTIGATION FINDINGS

The findings of the subsurface investigation, soil and groundwater sampling, monitoring well gauging, survey, and chemical analysis, are presented below. Analytical results are summarized in **Table 2** through **Table 5**. The analytical reports and chain-of-custody forms are included in **Appendix B**.

Analytical results were compared against the cleanup objectives as presented in 35 Illinois Administrative Code (IAC) Section 742.Appendix B: Table B-Tier 1 Soil Remediation Objectives for Commercial/Industrial Properties, and 35 IAC Section 742.Appendix B: Table E-Tier 1 Groundwater Remediation Objectives for the Direct Ingestion of Groundwater Portion of the Groundwater Ingestion Route.

Soil analytical results for the RCRA metals are shown as totals. Therefore, the soil component of the groundwater ingestion exposure route has not been considered. In addition, the groundwater beneath the site is classified as Class II, therefore the Class II baseline was used.

3.1 Sediment

BTEX. The analytical results indicated that BTEX constituents were not detected above the laboratory method detection limits.

TPH. The analytical results indicated that TPH as diesel was detected at concentrations of 630 milligrams per kilogram (mg/kg) in sample X-2 and 17,800 mg/kg in sample X-1, and TPH as oil was detected at concentrations ranging from 223 mg/kg in sample X-6 to 10,900 mg/kg in sample X-4. However, cleanup objectives for TPH have not been established by the IEPA. TPH as gasoline was not detected above the laboratory method detection limits.

PNAs. The analytical results indicated that PNA constituents were detected in the sediment samples collected. However, these concentrations were not above the IEPA cleanup objectives.

PCBs. The analytical results indicated that PCBs were detected at a concentration of 0.17 mg/kg in sample X-1. However, this concentration was not above the IEPA cleanup objective of 1.0 mg/kg.

Metals. The analytical results indicated that arsenic and lead were detected at concentrations above the IEPA cleanup objectives of 3 mg/kg and 400 mg/kg, respectively. Arsenic was detected at concentrations ranging from 9.7 mg/kg in sample X-3 to 69 mg/kg in sample X-1. However, only two of the concentrations of arsenic are within the range of arsenic (0.35 mg/kg to 24 mg/kg) detected by the EPA during a state wide soil survey in 1992. Arsenic was detected at concentrations greater than 24 mg/kg in samples X-1 and X-4 through X-6. Lead was detected at a concentration of 415 mg/kg in sample X-1.

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pH. pH values ranged from 7.38 in sample X-4 to 8.92 in sample X-5.

Analytical results are summarized in **Table 2**, and sampling locations are illustrated on **Figure 3**. The analytical report and chain-of-custody forms are included in **Appendix B**.

3.2 Surface Soil

BTEX. The analytical results indicated that BTEX constituents were detected in the surface soil samples collected. However, these concentrations were not above the IEPA cleanup objectives.

TPH. The analytical results indicated that TPH as gasoline was detected at a concentration of 472 mg/kg in sample S-5, and TPH as diesel was detected at concentrations ranging from 1,290 mg/kg in sample S-7 to 94,000 mg/kg in sample S-2. TPH as oil was detected at concentrations ranging from 390 mg/kg in sample S-1 to 283,000 mg/kg in sample S-8. However, cleanup objectives for TPH have not been established by the IEPA.

PNAs. The analytical results indicated that benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, and dibenzo(a,h)anthracene were detected in sample S-1 at concentrations above the IEPA cleanup objectives. It should be noted that samples S-8 and S-13 through S-15 had elevated detection limits due to matrix interference. These elevated detection limits are above the cleanup objectives for benzo(a)anthracene, benzo(a)pyrene, and dibenzo(a,h)anthracene, and consequently, there is a possibility that the concentrations are actually above the cleanup objectives. Refer to **Table 3** for PNA results.

PCBs. The analytical results indicated that PCBs were detected at concentrations ranging from 0.063 mg/kg in sample S-1 to 0.79 mg/kg in sample S-11. However, these concentrations were not above the IEPA cleanup objective of 1.0 mg/kg.

Metals. The analytical results indicated that arsenic and lead were detected at concentrations above the IEPA cleanup objectives of 3 mg/kg and 400 mg/kg, respectively. Arsenic was detected at concentrations ranging from 3.7 mg/kg in sample S-4 to 29 mg/kg in sample S-11. However, the majority of concentrations of arsenic are within the range of arsenic (0.35 mg/kg to 24 mg/kg) detected by the EPA during a state wide soil survey in 1992. Arsenic was detected at a concentration of 29 mg/kg in sample S-11. Lead was detected at a concentration of 1,340 mg/kg in sample S-11.

pH. pH values ranged from 6.20 in sample S-8 to 8.72 in sample S-3.

Analytical results are summarized in **Table 3**, and sampling locations are illustrated on **Figure 4**. The analytical report and chain-of-custody forms are included in **Appendix B**.

3.3 Subsurface Soil

Native soil encountered beneath the fill material consisted primarily of a brown to gray fine to medium sand to the maximum depth of the borings at 8 feet below grade. Soil boring logs are included in **Appendix A**.

The PID readings obtained from the soil samples collected ranged from 1.4 ppmv in B-13 and B-14 (0 to 4 feet below grade) to 123 ppmv in B-18 (0 to 4 feet below grade). The PID field screening results are recorded on the boring logs in **Appendix A**.

BTEX. The analytical results indicated that BTEX constituents were detected in the subsurface soil samples collected. However, these concentrations were not above the IEPA cleanup objectives.

PNAs. The analytical results indicated that benzo(a)pyrene and dibenzo(a,h)anthracene were detected in B-9 and B-11 at concentrations above the IEPA cleanup objectives. It should be noted that B-16 had an elevated detection limit due to matrix interference. These elevated detection limits are above the cleanup objectives for benzo(a)anthracene and benzo(a)pyrene, and consequently, there is a possibility that the concentrations are actually above the cleanup objectives. Refer to **Table 4** for PNA results.

PCBs. The analytical results indicated that PCBs were detected at a concentration of 1.02 mg/kg in B-15, which is above the IEPA cleanup objective of 1.0 mg/kg.

Metals. The analytical results indicated that arsenic was detected at concentrations above the IEPA cleanup objectives of 3 mg/kg. Arsenic was detected at concentrations ranging from 3.3 mg/kg in B-6 and B-16 to 25 mg/kg in B-20. However, the majority of concentrations of arsenic are within the range of arsenic (0.35 mg/kg to 24 mg/kg) detected by the EPA during a state wide soil survey in 1992. Arsenic was detected at a concentration of 25 mg/kg in B-20.

pH. pH values ranged from 7.01 in B-12 to 9.34 in B-21.

Analytical results are summarized in **Table 4**, and soil boring locations are illustrated on **Figure 5**. The analytical report and chain-of-custody forms are included in **Appendix B**.

3.4 Groundwater

The groundwater elevations ranged from 1.30 feet in MW-3 to 7.48 feet in MW-6. LPHC was not detected in any of the monitoring wells. Based on the gauging data, the apparent groundwater flow direction beneath the facility has been calculated to be to the east in the direction of Lake Michigan (**Figure 6**, **Groundwater Elevation Map**). Monitoring well gauging data is included in **Appendix C**.

Water quality field parameters consisting of pH, specific conductivity, and temperature were measured. The recorded measurements are summarized in **Table 5**.

BTEX. The analytical results indicated that BTEX constituents were detected in the groundwater samples collected. However, these concentrations were not above the IEPA cleanup objectives.

PNAs. The analytical results indicated that PNA constituents were detected in the groundwater samples collected. However, these concentrations were not above the IEPA cleanup objectives.

PCBs. The analytical results indicated that PCBs were not detected above the laboratory method detection limit.

Metals. The analytical results indicated that arsenic was detected at concentrations above the IEPA cleanup objectives of 0.2 milligrams per liter (mg/l). Arsenic was detected at a concentration of 1.1 mg/l in MW-11.

Analytical results are summarized in **Table 5**, and monitoring well locations are illustrated on **Figure 5**. The analytical report and chain-of-custody forms are included in **Appendix B**.

4.0 DATA ASSESSMENT

4.1 Extent of Contamination

Based on the results of the subsurface investigation conducted, the following determinations and assessments were made regarding the extent of contamination at the facility. The following conclusions are subject to the Limitations presented in **Section 1.4**. In addition, although arsenic was detected above the IEPA cleanup objective, the majority of concentrations of arsenic are within the range of arsenic detected by the EPA during a state wide soil survey in 1992. However, it should be noted that soil analytical results for the RCRA metals are shown as totals. Therefore, the soil component of the groundwater ingestion exposure route has not been considered.

4.1.1 Sediment

Arsenic and lead were the constituents of concern detected at concentrations above the IEPA cleanup objective of 3 mg/kg and 400 mg/kg, respectively. In addition, arsenic was detected above the IEPA cleanup objective, at a maximum concentration of 69 mg/kg in all six sediment samples collected.

Lead was detected above the IEPA cleanup objectives, at a maximum concentration of 415 mg/kg in the following locations:

- **Wastewater Collection Ponds.** Western wastewater collection pond (X-1).

4.1.2 Surface Soil

Arsenic, lead, and PNA constituents listed as benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, and dibenzo(a,h)anthracene, were the constituents of concern detected at concentrations above the IEPA cleanup objectives.

PNA constituents were detected above the IEPA cleanup objectives in the following locations:

- **Railroad.** Railroad line northwest of the construction debris area (S-1).

It should be noted that due to matrix interference in samples S-8 and S-13 through S-15, benzo(a)anthracene, benzo(a)pyrene, and dibenzo(a,h)anthracene had elevated detection limits. Consequently, there is a possibility that the concentrations are actually above the cleanup objectives. These samples were collected from the chimneys/precipitators (S-8), Coal Handling Tractor Maintenance Building (S-13 and S-14), and diesel AST located north of the Coal Handling Tractor Maintenance Building (S-15).

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Arsenic was detected above the IEPA cleanup objective, at a maximum concentration of 29 mg/kg in the following locations:

- **Railroad.** Railroad line northwest of the construction debris area (S-1).
- **Jet Fuel ASTs.** Jet fuel ASTs located west of the peaking units (S-2).
- **Peaking Units.** Peaking units located southwest of the main building (S-4 and S-5).
- **Former Ignition Oil Pump House.** The former ignition oil pump house located southeast of the peaking units (S-7).
- **Chimneys/Precipitators.** Chimney units located east of the main building (S-8).
- **Used Oil ASTs.** The AST located east of the northeastern wastewater collection pond (S-9).
- **Transformers.** The transformers on the east side of the southern Crib House (S-11). It should be noted that lead was also detected above the IEPA cleanup objective of 400 mg/kg in this area (S-11) at a maximum concentration of 1,340 mg/kg.
- **Coal Handling Tractor Buildings.** The Coal Handling Tractor Maintenance Building (S-13 and S-14).
- **Diesel AST.** The diesel AST located north of the Coal Handling Tractor Maintenance Building (S-15).

4.1.3 Subsurface Soil

Arsenic, PCBs, and PNA constituents listed as benzo(a)pyrene and dibenzo(a,h)anthracene, were the constituents of concern detected at concentrations above the IEPA cleanup objectives.

PNA constituents were detected above the IEPA cleanup objectives in the following locations:

- **Gasoline/Diesel ASTs.** The gasoline and diesel AST located west of the two materials storage buildings on the north side of the facility (B-9).
- **Former UST.** A former UST located at the western gate house (B-11).

It should be noted that due to matrix interference in B-16, benzo(a)anthracene and benzo(a)pyrene had elevated detection limits. Consequently, there is a possibility that the concentrations are actually above the cleanup objectives. This sample was collected from the construction debris area at the southwestern corner of the facility (B-16).

Arsenic was detected above the IEPA cleanup objective, at a maximum concentration of 25 mg/kg in the following locations:

- **Construction Debris Area.** A construction debris area at the southwestern corner of the facility (B-1 and B-16).
- **Used Oil ASTs.** The AST west of the western wastewater collection pond (B-2).
- **Peaking Units.** Peaking units located southwest of the main building (B-3).

- **Transformers.** The transformers to the north of the peaking unit building (B-4) and transformers to the northeast of the jet fuel ASTs (B-19).
- **Fire Brigade Area.** A fire brigade area located west of the northeastern wastewater collection pond (B-6 and B-7).
- **Materials Storage Buildings.** The storage buildings located to the west of the fire brigade area (B-8).
- **Gasoline/Diesel ASTs.** The gasoline and diesel AST located west of the two materials storage buildings on the north side of the facility (B-9) and the diesel AST located north of the Coal Handling Tractor Building (B-18).
- **Former UST.** A former UST located at the western gate house (B-10 and B-11).
- **Railroad.** Railroad line in northwest corner of the facility (B-12).
- **Adjacent Properties.** A former tannery located west of the facility (B-12 through B-15)
- **Coal Runoff Pond.** The coal runoff pond located west of the coal pile (B-17).
- **Coal Handling Area.** North of the coal pile (B-20).
- **Ash Storage Area.** Ash storage area located at the southern end of the facility (B-22).
- **Lakeshore.** North of the intake/discharge flume at the northeast end of the facility (B-23).

PCBs were detected above the IEPA cleanup objective in the following locations:

- **Adjacent Properties.** A former tannery located west of the facility (B-15).

4.1.4 Groundwater

Arsenic was the only constituent of concern detected at concentrations above the IEPA cleanup objectives.

Arsenic was detected above the IEPA cleanup objective, at a maximum concentration of 1.1 mg/l in the following locations:

- **Construction Debris Area.** A construction debris area at the southwestern corner of the facility (MW-11). This area is adjacent to the former Tannery property owned by ComEd.

4.2 Potential Contaminant Exposure Pathways

Based on the above-referenced assessment, potential exposure pathways by which humans may be exposed to the constituents of concern have been identified at the facility. Potential sources, fate and transport mechanisms, and exposure media were considered in determining these potential exposure pathways. An identified potential exposure pathway does not imply that exposure is occurring, only that the potential exists for exposure.

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TABLES

Phase II Environmental Site Assessment
Commonwealth Edison Company
December 7, 1998

Waukegan Generating Station
10 Greenwood Avenue
Waukegan, Illinois

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4.2.1 Soil Ingestion

The soil ingestion pathway includes the first three feet within ground surface. Therefore, based on the analytical results, soil ingestion is a potential contaminant exposure pathway. Soil ingestion occurs when soil containing elevated concentrations of the constituents of concern are ingested into the body. The facility is an industrial site and direct contact and ultimately ingestion of the impacted soil is not likely to occur. However, construction activities would increase the possibility of exposure. Therefore, this pathway would need to allow for protection/prevention for the construction worker scenario.

4.2.2 Soil Inhalation

The soil inhalation pathway includes the first ten feet within ground surface. Therefore, based on the analytical results, soil inhalation is a potential contaminant exposure pathway. Soil inhalation occurs when elevated concentrations of the constituents of concern are inhaled into the body. However, the highly volatile constituents (i.e., BTEX, TPH as gasoline), were not detected at concentrations above the IEPA cleanup objectives. The constituents that were detected at concentrations above the IEPA cleanup objectives (i.e., metals, semi-volatiles, PCBs), are not considered highly volatile. Based on the relatively low volatility of the constituents of concern detected above the IEPA cleanup objectives, the soil inhalation exposure pathway is not a likely contaminant exposure pathway.

4.2.3 Groundwater Ingestion

The groundwater ingestion pathway includes groundwater being used as a potable source of water. Therefore, due to the fact that the City of Waukegan receives its potable water from Lake Michigan and the groundwater beneath the facility is not being used as a potable source of water, the groundwater ingestion is not a potential contaminant exposure pathway.

Based on the current land use (industrial) and site conditions (analytical results and soil types), it is judged that the potential for human exposure to the constituents of concern from this facility is low. However, personnel working at the facility could be susceptible to exposure due to accidental soil ingestion or soil inhalation due to activities such as construction. Such exposure may result from contact with contaminated subsurface or surface materials previously located beneath a protective barrier (i.e., concrete cap, building).

There is no requirement under Illinois environmental law to further investigate or remediate this property.

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Table 1

Sampling Locations and Analyses Summary

Commonwealth Edison Company
Waukegan Generating Station
10 Greenwood Avenue
Waukegan, Illinois

	Sampling Locations[1]	Sampling Parameters	Sampling Depth (in feet)	Date Collected
Sediment Sample Identification				
X-1	Wastewater Collection Ponds	TPH, BTEX, PNAs, PCBs, RCRA metals, pH	NA	10/29/98
X-2	Wastewater Collection Ponds	TPH, BTEX, PNAs, PCBs, RCRA metals, pH	NA	10/29/98
X-3	Wastewater Collection Ponds	TPH, BTEX, PNAs, PCBs, RCRA metals, pH	NA	10/29/98
X-4	Coal Runoff Pond	TPH, BTEX, PNAs, PCBs, RCRA metals, pH	NA	10/29/98
X-5	Ash Settling Ponds	TPH, BTEX, PNAs, PCBs, RCRA metals, pH	NA	10/29/98
X-6	Ash Settling Ponds	TPH, BTEX, PNAs, PCBs, RCRA metals, pH	NA	10/29/98
Surface Soil Sample Identification				
S-1	Railroad	TPH, BTEX, PNAs, PCBs, RCRA metals, pH	NA	10/26/98
S-2	Jet Fuel ASTs	TPH, BTEX, PNAs, PCBs, RCRA metals, pH	NA	10/27/98
S-3	Jet Fuel ASTs	TPH, BTEX, PNAs, PCBs, RCRA metals, pH	NA	10/27/98
S-4	Peaking Units	TPH, BTEX, PNAs, PCBs, RCRA metals, pH	NA	10/27/98
S-5	Peaking Units	TPH, BTEX, PNAs, PCBs, RCRA metals, pH	NA	10/27/98
S-6	Railroad	TPH, BTEX, PNAs, PCBs, RCRA metals, pH	NA	10/29/98
S-7	Former Ignition Oil Pump House	TPH, BTEX, PNAs, PCBs, RCRA metals, pH	NA	10/27/98
S-8	Chimneys/Precipitators	TPH, BTEX, PNAs, PCBs, RCRA metals, pH	NA	10/28/98
S-9	Used Oil ASTs	TPH, BTEX, PNAs, PCBs, RCRA metals, pH	NA	10/28/98
S-11	Transformers	TPH, BTEX, PNAs, PCBs, RCRA metals, pH	NA	10/29/98
S-13	Coal Handling Tractor Buildings	TPH, BTEX, PNAs, PCBs, RCRA metals, pH	NA	10/28/98
S-14	Coal Handling Tractor Buildings	TPH, BTEX, PNAs, PCBs, RCRA metals, pH	NA	10/28/98
S-15	Diesel AST	TPH, BTEX, PNAs, PCBs, RCRA metals, pH	NA	10/28/98
Monitoring Well Sample Identification				
MW-11	Construction Debris Area	BTEX, PNAs, PCBs, RCRA metals, pH	NA	10/29/98
MW-2 (B-3)	Peaking Units	BTEX, PNAs, PCBs, RCRA metals, pH	NA	10/29/98
MW-3 (B-12)	Railroad	BTEX, PNAs, PCBs, RCRA metals, pH	NA	10/29/98
MW-12	Adjacent Properties	BTEX, PNAs, PCBs, RCRA metals, pH	NA	10/29/98
MW-5 (B-18)	Diesel AST	BTEX, PNAs, PCBs, RCRA metals, pH	NA	10/29/98
MW-6 (B-21)	Lakeshore	BTEX, PNAs, PCBs, RCRA metals, pH	NA	10/29/98
MW-7 (B-23)	Lakeshore	BTEX, PNAs, PCBs, RCRA metals, pH	NA	10/29/98

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Table 1

Sampling Locations and Analyses Summary

Commonwealth Edison Company
Waukegan Generating Station
10 Greenwood Avenue
Waukegan, Illinois

	Sampling Locations	Sampling Parameters	Sampling Depth (in feet)	Date Collected
Boring Identification				
B-1	**Construction Debris Area**	BTEX, PNAs, PCBs, RCRA metals, pH	0-4	10/29/98
B-2	**Used Oil ASTs**	BTEX, PNAs, PCBs, RCRA metals, pH	0-4	10/26/98
B-3	**Peaking Units**	BTEX, PNAs, PCBs, RCRA metals, pH	1-3	10/27/98
B-4	**Transformers**	BTEX, PNAs, PCBs, RCRA metals, pH	0-4	10/26/98
B-6	**Fire Brigade Area**	BTEX, PNAs, PCBs, RCRA metals, pH	0-4	10/29/98
B-7	**Fire Brigade Area**	BTEX, PNAs, PCBs, RCRA metals, pH	0-4	10/29/98
B-8	**Materials Storage Buildings**	BTEX, PNAs, PCBs, RCRA metals, pH	0-4	10/29/98
B-9	**Gasoline/Diesel AST**	BTEX, PNAs, PCBs, RCRA metals, pH	0-4	10/29/98
B-10	**Former UST**	BTEX, PNAs, PCBs, RCRA metals, pH	0-4	10/29/98
B-11	**Former UST**	BTEX, PNAs, PCBs, RCRA metals, pH	0-4	10/29/98
B-12	**Railroad**	BTEX, PNAs, PCBs, RCRA metals, pH	1-3	10/28/98
B-13	**Adjacent Properties**	BTEX, PNAs, PCBs, RCRA metals, pH	0-4	10/26/98
B-14	**Adjacent Properties**	BTEX, PNAs, PCBs, RCRA metals, pH	0-4	10/26/98
B-15	**Adjacent Properties**	BTEX, PNAs, PCBs, RCRA metals, pH	0-4	10/29/98
B-16	**Construction Debris Area**	BTEX, PNAs, PCBs, RCRA metals, pH	0-4	10/26/98
B-17	**Coal Runoff Pond**	BTEX, PNAs, PCBs, RCRA metals, pH	0-4	10/29/98
B-18	**Diesel AST**	BTEX, PNAs, PCBs, RCRA metals, pH	1-3	10/27/98
B-19	**Transformers**	BTEX, PNAs, PCBs, RCRA metals, pH	0-4	10/26/98
B-20	**Coal Handling Area**	BTEX, PNAs, PCBs, RCRA metals, pH	0-4	10/26/98
B-21	**Lakeshore**	BTEX, PNAs, PCBs, RCRA metals, pH	0-4	10/26/98
B-22	**Ash Storage Area**	BTEX, PNAs, PCBs, RCRA metals, pH	0-2	10/26/98
B-23	**Lakeshore**	BTEX, PNAs, PCBs, RCRA metals, pH	1-3	10/27/98

Notes:

BTEX was analyzed using EPA Method 8260.

PNAs were analyzed using EPA Method 8310

PCBs were analyzed using EPA Method 8081.

RCRA metals were analyzed using EPA Method series 6000 and 7000.

pH was measured using EPA Method 9045.

(1) Sampling locations are referenced in the Phase II Environmental Site Assessment Report in **Section 2.0**.

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Table 2
Sediment Sampling
Soil Analytical Results in Milligrams per Kilogram (mg/kg)
Commonwealth Edison Company - Waukegan Generating Station
10 Greenwood Avenue
Waukegan, Illinois

Sample I.D. / Lab I.D. / Sample Date	X-1 500676 10/29/98	X-2 500677 10/29/98	X-3 500679 10/29/98	X-4 500675 10/29/98	X-5 500680 10/29/98	X-6 500681 10/29/98	IEPA Soil Cleanup Objectives
Parameters							
BTEX							
Benzene	< 0.02	< 0.009	< 0.01	< 0.01	< 0.009	< 0.01	0.17
Toluene	< 0.02	< 0.009	< 0.01	< 0.01	< 0.009	< 0.01	29
Ethyl Benzene	< 0.02	< 0.009	< 0.01	< 0.01	< 0.009	< 0.01	19
Total Xylenes	< 0.02	< 0.009	< 0.01	< 0.01	< 0.009	< 0.01	150
TPH							
Gasoline	< 170	< 89	< 130	< 140	< 94	< 100	NA[1]
Diesel	17,800	630	< 130	< 140	< 94	< 100	NA
Oil	< 170	< 89	9,390	10,900	< 94	223	NA
PNAs							
Acenaphthene	< 0.069	< 0.036	< 0.12	< 0.3	< 0.038	< 0.042	2,800
Acenaphthylene	< 0.069	< 0.036	< 0.051	< 0.3	< 0.038	< 0.042	NA
Anthracene	< 0.27	< 0.072	< 0.10	< 0.6	< 0.075	< 0.084	59,000
Benzo(a)anthracene	< 0.17	< 0.036	< 0.74	< 2.0	< 0.043	< 0.10	8
Benzo(a)pyrene	< 0.066	< 0.014	< 0.13	< 0.49	< 0.0087	< 0.0096	0.8
Benzo(b)fluoranthene	< 0.093	< 0.0064	0.092	< 0.57	< 0.0068	< 0.0075	8
Benzo(g,h,i)perylene	< 0.14	< 0.072	< 0.10	< 0.6	< 0.075	< 0.084	NA
Benzo(k)fluoranthene	< 0.13	0.0081	< 0.20	< 0.70	< 0.032	< 0.0071	78
Chrysene	< 0.55	< 0.05	0.17	< 0.4	< 0.06	< 0.06	780
Dibenzo(a,h)anthracene	< 0.02	< 0.01	< 0.031	< 0.1	< 0.01	< 0.01	0.8
Fluoranthene	< 1.3	< 0.036	0.33	< 0.3	< 0.038	< 0.042	21,000
Fluorene	< 0.59	< 0.036	< 0.79	< 0.57	< 0.038	< 0.042	2,800
Indeno(1,2,3-c,d)pyrene	0.031	< 0.015	0.061	< 0.1	< 0.016	< 0.018	8
Naphthalene	< 0.087	0.15	< 0.064	< 0.3	< 0.047	< 0.052	420
Phenanthrene	< 0.14	< 0.072	0.23	< 0.6	< 0.075	< 0.084	NA
Pyrene	< 1.9	< 0.036	0.28	0.32	< 0.038	< 0.042	21,000
RCRA Metals[2]							
Arsenic	69	16	9.7	35	28	33	3
Barium	190	160	765	892	3,770	3,970	14,000
Cadmium	< 3.1	1.7	2.2	< 2.5	2.1	2.9	200
Chromium	19	38	31	15	42	52	420
Lead	415	30	71	26	55	71	400
Mercury	0.25	< 0.072	0.92	0.15	0.77	0.73	61
Selenium	< 0.87	< 0.45	0.71	0.76	2.6	2.5	1,000
Silver	< 6.9	< 3.6	< 5.1	< 5.4	4.5	< 4.2	1,000
Total PCBs	0.17	< 0.072	< 0.10	< 0.11	< 0.075	< 0.084	1
pH	7.99	7.78	7.99	7.38	8.92	8.89	NA

Notes:
Cleanup objectives were derived from Illinois Environmental Protection Agency Section 742 Appendix B-Table B Tier 1 Soil Remediation Objectives for Industrial/Commercial Properties

[1] NA indicates not applicable, cleanup objectives have not been established for these parameters
[2] Results are shown as totals, therefore the soil component of the groundwater ingestion exposure route has not been considered

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Table 3
Surface Soil Sampling
Soil Analytical Results in Milligrams per Kilogram (mg/kg)
Commonwealth Edison Company - Waukegan Generating Station
10 Greenwood Avenue
Waukegan, Illinois

Sample I.D. / Lab I.D. / Sample Date	S-1 499921 10/26/98	S-2 500402 10/27/98	S-3 500401 10/27/98	S-4 500399 10/27/98	S-5 500400 10/27/98	S-6 500678 10/29/98	IEPA Soil Cleanup Objectives
Parameters							
BTEX							
Benzene	< 0.006	0.02	< 0.006	< 0.005	< 0.006	< 0.005	**0.17**
Toluene	< 0.006	0.36	< 0.006	< 0.005	< 0.006	< 0.005	**29**
Ethyl Benzene	< 0.006	0.61	< 0.006	< 0.005	< 0.006	< 0.005	**19**
Total Xylenes	< 0.006	3.6	< 0.006	< 0.005	< 0.006	< 0.005	**150**
TPH							
Gasoline	< 56	< 904	< 59	< 518	472	< 52	**NA[1]**
Diesel	< 56	94,000	< 59	< 518	< 55	5,790	**NA**
Oil	390	< 904	< 59	14,900	4,710	< 52	**NA**
PNAs							
Acenaphthene	< 1.8	< 2.9	< 0.023	< 0.94	< 0.2	< 2.1	**2,800**
Acenaphthylene	< 1.8	< 2.9	< 0.023	< 0.94	< 0.2	< 2.1	**NA**
Anthracene	< 3.6	< 85	< 0.093	< 1.8	< 0.61	< 4.2	**59,000**
Benzo(a)anthracene	**13**	< 5.8	< 0.10	< 1.1	< 0.81	< 1.4	**8**
Benzo(a)pyrene	**9.7**	< 0.66	0.03	< 0.22	< 0.14	< 0.48	**0.8**
Benzo(b)fluoranthene	**15**	< 0.52	0.018	< 0.49	0.078	< 0.38	**8**
Benzo(g,h,i)perylene	9.8	< 5.8	< 0.047	< 1.8	< 0.4	< 4.2	**NA**
Benzo(k)fluoranthene	8.2	< 0.49	0.023	< 0.16	< 0.31	< 0.36	**78**
Chrysene	17	< 4	0.041	< 1	< 0.2	< 3	**780**
Dibenzo(a,h)anthracene	**1.1**	< 0.8	0.0083	< 0.3	< 0.06	< 0.6	**0.8**
Fluoranthene	34	< 52	0.1	< 0.94	< 0.75	< 2.1	**21,000**
Fluorene	< 3.5	< 16	0.033	< 0.94	< 0.2	< 2.1	**2,800**
Indeno(1,2,3-c,d)pyrene	7.6	< 1.3	0.021	< 0.40	< 0.08	< 0.90	**8**
Naphthalene	**4**	65	0.042	< 1.2	< 0.2	< 2.6	**420**
Phenanthrene	13	< 8.9	0.11	< 1.8	1.2	< 4.2	**NA**
Pyrene	34	< 42	0.056	< 0.94	0.41	< 7.0	**21,000**
RCRA Metals[2]							
Arsenic	**5.2**	**6.5**	1.6	**3.7**	**5.3**	2.8	**3**
Barium	236	150	9.5	124	42	41	**14,000**
Cadmium	2.5	6	< 0.59	6.2	13	< 0.52	**200**
Chromium	51	29	7.6	104	13	4.5	**420**
Lead	29	130	11	48	33	8.5	**400**
Mercury	< 0.045	0.16	< 0.047	< 0.041	< 0.044	< 0.042	**61**
Selenium	< 0.28	0.51	< 0.29	< 0.26	< 0.28	0.31	**1,000**
Silver	< 2.2	< 3.6	< 2.3	< 2.1	< 2.2	2.2	**1,000**
Total PCBs	0.063	0.24	0.073	< 0.41	0.341	< 0.2	**1**
pH	8.35	6.93	8.72	7.10	7.76	6.60	**NA**

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Table 3
Surface Soil Sampling
Soil Analytical Results in Milligrams per Kilogram (mg/kg)
Commonwealth Edison Company - Waukegan Generating Station
10 Greenwood Avenue
Waukegan, Illinois

Sample I.D. Lab I.D. Sample Date	S-7 500397 10/27/98	S-8 500409 10/28/98	S-9 500408 10/28/98	S-11 500674 10/29/98	S-13 500406 10/28/98	S-14 500405 10/28/98	S-15 500404 10/28/98	IEPA Soil Cleanup Objectives
Parameters								
BTEX								
Benzene	< 0.007	< 0.006	< 0.006	< 0.008	< 0.006	< 0.006	< 0.007	0.17
Toluene	< 0.007	< 0.006	< 0.006	< 0.008	< 0.006	< 0.006	< 0.007	29
Ethyl Benzene	< 0.007	< 0.006	< 0.006	< 0.008	< 0.006	< 0.006	< 0.007	19
Total Xylenes	< 0.007	< 0.006	< 0.006	< 0.008	< 0.006	< 0.006	< 0.007	150
TPH								
Gasoline	< 69	< 1,160	< 234	< 809	< 65	< 63	< 653	NA
Diesel	1,290	< 1,160	< 234	< 809	< 65	< 63	87,600	NA
Oil	< 69	283,000	12,500	65,000	11,200	2,240	< 653	NA
PNAs								
Acenaphthene	< 2.5	< 3.4	< 0.92	< 0.32	< 2.6	< 1.0	< 8.7	2,800
Acenaphthylene	< 2.5	< 3.4	< 0.92	< 0.32	< 2.6	< 1.0	< 25	NA
Anthracene	< 5.0	< 6.9	< 1.9	< 0.65	< 5.2	< 2.0	< 100	59,000
Benzo(a)anthracene	< 5.7	< 3.9	< 0.67	< 0.39	**< 8.1**	**< 9.6**	**< 21**	8
Benzo(a)pyrene	< 0.57	< 0.80	< 0.22	0.11	< 0.79	**< 1.1**	< 0.54	0.8
Benzo(b)fluoranthene	< 0.45	< 0.63	< 0.28	0.079	< 1.7	< 0.67	< 5.0	8
Benzo(g,h,i)perylene	< 5.0	< 6.9	< 1.9	< 0.65	< 5.2	< 2.0	< 4.7	NA
Benzo(k)fluoranthene	< 0.42	< 0.58	< 0.23	0.099	< 32	< 1.2	< 1.1	78
Chrysene	< 4	< 4	< 2	< 0.5	< 4	< 2	< 6.7	780
Dibenzo(a,h)anthracene	< 0.7	**< 1**	< 0.3	< 0.1	< 0.8	**< 0.92**	< 0.7	0.8
Fluoranthene	< 2.5	< 3.4	< 0.92	< 0.32	< 2.6	< 1.6	< 89	21,000
Fluorene	< 2.5	< 3.4	< 0.92	< 0.32	< 2.6	< 1.0	65	2,800
Indeno(1,2,3-c,d)pyrene	< 1.1	< 1.5	< 0.40	< 0.14	< 1.1	< 0.44	< 0.99	8
Naphthalene	15	< 4.4	< 1.2	< 0.40	< 3.2	< 1.2	< 34	420
Phenanthrene	7.3	< 6.9	< 1.9	0.66	< 5.2	< 2.0	< 72	NA
Pyrene	< 2.5	< 3.4	< 0.92	< 0.32	< 2.6	< 1.6	< 157	21,000
RCRA Metals								
Arsenic	**5.2**	**10**	**9.8**	**29**	**3.9**	**5.3**	**3.3**	3
Barium	207	139	152	1,230	377	605	470	14,000
Cadmium	2.6	6	11	18	< 1.3	< 1.2	1.4	200
Chromium	29	39	16	150	18	26	12	420
Lead	70	139	49	**1,340**	18	26	42	400
Mercury	0.072	0.11	0.41	0.15	< 0.052	0.087	0.056	61
Selenium	0.76	2.2	0.42	2.6	0.34	2.4	0.38	1,000
Silver	< 2.8	< 2.3	< 2.3	< 3.2	< 2.6	< 2.5	< 2.6	1,000
Total PCBs	0.207	< 0.46	< 0.047	0.79	< 0.052	< 0.050	< 0.3	1
pH	8.15	6.20	7.61	7.61	7.44	7.75	7.08	NA

Notes:
Cleanup objectives were derived from Illinois Environmental Protection Agency Section 742 Appendix B-Table B: Tier 1 Soil Remediation Objectives for Industrial/Commercial Properties.

(1) NA indicates not applicable, cleanup objectives have not been established for these parameters.
(2) Results are shown as totals, therefore the soil component of the groundwater ingestion exposure route has not been considered.

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Table 4
Subsurface Soil Sampling
Soil Analytical Results in Milligrams per Kilogram (mg/kg)
Commonwealth Edison Company - Waukegan Generating Station
10 Greenwood Avenue
Waukegan, Illinois

Sample I.D.	B-1	B-2	B-3	B-4	B-6	B-7	B-8	
Lab I.D.	500671	499916	500398	499915	500669	500670	500668	IEPA Soil
Sample Date	10/29/98	10/26/98	10/27/98	10/26/98	10/29/98	10/29/98	10/29/98	Cleanup
Sample Depth (feet)	0-4	0-4	1-3	0-4	0-4	0-4	0-4	Objectives
Parameters								
BTEX								
Benzene	< 0.005	< 0.005	< 0.006	< 0.006	< 0.005	< 0.006	< 0.005	**0.17**
Toluene	< 0.005	< 0.005	< 0.006	< 0.006	< 0.005	< 0.006	< 0.005	**29**
Ethyl Benzene	< 0.005	< 0.005	< 0.006	< 0.006	< 0.005	< 0.006	< 0.005	**19**
Total Xylenes	< 0.005	< 0.005	< 0.006	< 0.006	0.015	< 0.006	< 0.005	**150**
PNAs								
Acenaphthene	< 0.021	< 0.022	< 0.23	< 0.024	< 0.06	< 0.09	< 0.54	**2,800**
Acenaphthylene	< 0.021	< 0.022	< 0.23	< 0.024	< 0.06	< 0.09	< 0.1	**NA[1]**
Anthracene	< 0.042	< 0.18	< 1.1	< 0.12	< 0.1	< 0.2	< 0.2	**59,000**
Benzo(a)anthracene	0.042	0.31	0.46	0.041	< 0.030	< 0.01	0.21	**8**
Benzo(a)pyrene	0.032	0.11	0.24	0.0092	< 0.01	< 0.02	0.31	**0.8**
Benzo(b)fluoranthene	0.017	0.062	0.22	0.012	< 0.01	< 0.02	0.65	**8**
Benzo(g,h,i)perylene	< 0.042	0.1	< 0.46	< 0.048	< 0.1	< 0.2	0.49	**NA**
Benzo(k)fluoranthene	< 0.027	< 0.13	0.15	< 0.0041	< 0.01	< 0.02	0.18	**78**
Chrysene	0.036	0.34	< 0.3	< 0.04	< 0.1	< 0.1	0.22	**780**
Dibenzo(a,h)anthracene	0.0074	0.038	< 0.07	< 0.007	< 0.02	< 0.03	0.038	**0.8**
Fluoranthene	0.03	< 0.70	< 1.4	< 0.074	< 3.4	< 0.09	0.98	**21,000**
Fluorene	< 0.021	< 0.077	< 0.46	< 0.045	< 0.06	< 0.09	0.21	**2,800**
Indeno(1,2,3-c,d)pyrene	< 0.0091	0.047	< 0.10	< 0.010	< 0.03	< 0.04	0.29	**8**
Naphthalene	0.033	0.34	1.4	0.26	< 0.08	< 0.1	0.16	**420**
Phenanthrene	0.061	0.92	1.5	0.16	< 0.1	< 0.2	0.36	**NA**
Pyrene	0.076	0.48	< 1.9	< 0.042	< 0.06	< 0.09	0.76	**21,000**
RCRA Metals[2]								
Arsenic	**6.7**	**3.6**	**4.2**	**4.4**	**3.3**	**6.4**	**6.3**	**3**
Barium	601	22	38	16	14	247	27	**14,000**
Cadmium	1	< 0.54	0.84	< 0.60	< 0.53	< 0.56	< 0.54	**200**
Chromium	232	8.3	14	31	5.7	7.6	8.5	**420**
Lead	40	14	21	13	10	16	35	**400**
Mercury	< 0.042	0.083	0.05	< 0.048	< 0.042	< 0.045	0.52	**61**
Selenium	< 0.26	< 0.27	< 0.29	< 0.30	< 0.26	< 0.28	< 0.27	**1,000**
Silver	< 2.1	< 2.2	< 2.3	< 2.4	< 2.1	< 2.2	< 2.2	**1,000**
Total PCBs	< 0.042	< 0.043	< 0.046	< 0.048	0.048	< 0.045	< 0.043	**1**
pH	9.16	8.80	7.41	7.50	9.33	9.06	8.68	**NA**

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Table 4
Subsurface Soil Sampling
Soil Analytical Results in Milligrams per Kilogram (mg/kg)
Commonwealth Edison Company - Waukegan Generating Station
10 Greenwood Avenue
Waukegan, Illinois

Sample I.D.	B-9	B-10	B-11	B-12	B-13	B-14	B-15	
Lab I.D.	500667	500665	500666	500407	499917	499918	500672	IEPA Soil
Sample Date	10/29/98	10/29/98	10/29/98	10/28/98	10/26/98	10/26/98	10/29/98	Cleanup
Sample Depth (feet)	0-4	0-4	0-4	1-3	0-4	0-4	0-4	Objectives
Parameters								
BTEX								
Benzene	< 0.006	< 0.006	< 0.006	< 0.006	< 0.006	< 0.006	< 0.006	**0.17**
Toluene	< 0.006	< 0.006	< 0.006	< 0.006	< 0.006	< 0.006	< 0.006	**29**
Ethyl Benzene	< 0.006	< 0.006	< 0.006	< 0.006	< 0.006	< 0.006	< 0.006	**19**
Total Xylenes	< 0.006	< 0.006	< 0.006	< 0.006	< 0.006	< 0.006	< 0.006	**150**
PNAs								
Acenaphthene	< 1.4	< 0.022	< 5.4	< 0.024	< 0.1	< 0.022	< 0.023	**2,800**
Acenaphthylene	< 1.4	< 0.022	< 1.8	< 0.024	< 0.1	< 0.022	< 0.023	**NA**
Anthracene	< 2.8	< 0.044	< 3.6	< 0.047	< 0.3	< 0.044	< 0.071	**59,000**
Benzo(a)anthracene	4.6	0.051	6.1	< 0.017	0.18	< 0.031	< 0.063	**8**
Benzo(a)pyrene	**4.4**	0.033	**3.5**	0.013	0.14	< 0.0096	0.032	**0.8**
Benzo(b)fluoranthene	3.7	0.031	3.5	0.0098	0.068	0.0096	0.014	**8**
Benzo(g,h,i)perylene	3	< 0.044	4.8	< 0.047	< 0.3	< 0.044	< 0.046	**NA**
Benzo(k)fluoranthene	2.2	0.022	< 2.9	0.0059	< 0.032	< 0.0082	< 0.015	**78**
Chrysene	3.7	0.047	9.1	< 0.04	< 0.2	< 0.03	< 0.03	**780**
Dibenzo(a,h)anthracene	< 0.4	< 0.007	**0.95**	< 0.007	< 0.04	< 0.007	< 0.007	**0.8**
Fluoranthene	9	0.12	4.6	< 0.045	< 0.56	< 0.022	< 0.10	**21,000**
Fluorene	< 1.4	< 0.022	< 1.8	< 0.024	< 0.1	< 0.022	< 0.044	**2,800**
Indeno(1,2,3-c,d)pyrene	2.5	0.021	1.6	< 0.010	< 0.06	< 0.0095	< 0.0099	**8**
Naphthalene	< 1.7	0.041	< 2.2	0.11	< 0.2	< 0.028	0.11	**420**
Phenanthrene	5.2	0.086	23	0.073	0.67	< 0.044	0.14	**NA**
Pyrene	7.3	0.074	11	< 0.024	< 0.45	< 0.022	< 0.046	**21,000**
RCRA Metals								
Arsenic	**16**	**5.9**	**18**	**7.6**	**5.7**	**7.5**	**13**	**3**
Barium	290	42	59	509	76	322	493	**14,000**
Cadmium	1.3	0.57	1.9	1.4	1.3	0.7	0.86	**200**
Chromium	22	7.6	25	154	18	233	126	**420**
Lead	81	34	64	77	52	35	41	**400**
Mercury	0.27	0.053	0.074	< 0.047	0.11	0.058	0.055	**61**
Selenium	0.31	< 0.28	< 0.28	0.43	< 0.32	< 0.28	< 0.29	**1,000**
Silver	< 2.3	< 2.2	< 2.3	< 2.4	< 2.6	< 2.2	< 2.3	**1,000**
Total PCBs	0.057	< 0.044	< 0.045	< 0.047	< 0.052	< 0.044	**1.02**	**1**
pH	9.12	8.40	7.46	7.01	7.10	9.04	8.42	**NA**

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Table 4
Subsurface Soil Sampling
Soil Analytical Results in Milligrams per Kilogram (mg/kg)
Commonwealth Edison Company - Waukegan Generating Station
10 Greenwood Avenue
Waukegan, Illinois

Sample I.D.	B-16	B-17	B-18	B-19	B-20	B-21	B-22	B-23	
Lab I.D.	499919	500673	500403	499914	499913	499912	499920	500396	IEPA Soil
Sample Date	10/26/98	10/29/98	10/27/98	10/26/98	10/26/98	10/26/98	10/26/98	10/27/98	Cleanup
Sample Depth (feet)	0-4	0-4	1-3	0-4	0-4	0-4	0-2	1-3	Objectives
Parameters									
BTEX									
Benzene	< 0.006	< 0.005	< 0.006	< 0.005	< 0.006	< 0.005	< 0.006	< 0.006	**0.17**
Toluene	< 0.006	< 0.005	< 0.006	< 0.005	< 0.006	< 0.005	< 0.006	< 0.006	**29**
Ethyl Benzene	< 0.006	< 0.005	< 0.006	< 0.005	< 0.006	< 0.005	< 0.006	< 0.006	**19**
Total Xylenes	< 0.006	< 0.005	< 0.006	< 0.005	< 0.006	< 0.005	< 0.006	< 0.006	**150**
PNAs									
Acenaphthene	< 2.0	< 0.021	< 0.1	< 0.022	< 0.024	< 0.021	< 0.058	0.028	**2,800**
Acenaphthylene	< 2.0	< 0.021	< 0.1	< 0.022	< 0.024	< 0.021	< 0.067	< 0.025	**NA**
Anthracene	< 4.0	< 0.043	< 0.27	< 0.043	< 0.048	< 0.042	< 0.22	0.11	**59,000**
Benzo(a)anthracene	< 10	< 0.067	< 0.77	0.067	< 0.66	0.043	< 0.32	0.18	**8**
Benzo(a)pyrene	< 2.0	0.015	0.28	0.035	< 0.038	0.035	< 0.054	0.2	**0.8**
Benzo(b)fluoranthene	< 1.9	0.019	0.24	0.03	< 0.017	0.038	< 0.032	0.11	**8**
Benzo(g,h,i)perylene	< 4.0	< 0.043	0.26	< 0.043	< 0.048	< 0.042	< 0.051	0.14	**NA**
Benzo(k)fluoranthene	< 2.1	< 0.032	< 0.42	< 0.024	< 0.064	0.022	< 0.018	0.087	**78**
Chrysene	< 3	< 0.03	0.36	0.056	0.078	0.034	< 0.076	0.15	**780**
Dibenzo(a,h)anthracene	< 0.6	< 0.006	< 0.064	< 0.0080	< 0.023	< 0.006	< 0.019	0.02	**0.8**
Fluoranthene	< 2.0	< 0.057	< 0.49	0.13	< 0.12	0.085	< 0.28	0.41	**21,000**
Fluorene	< 2.0	< 0.021	< 0.1	< 0.022	< 0.024	< 0.021	< 0.14	0.041	**2,800**
Indeno(1,2,3-c,d)pyrene	< 0.88	< 0.0092	0.081	0.022	< 0.010	0.024	< 0.046	0.1	**8**
Naphthalene	< 2.5	0.1	0.73	0.082	0.038	< 0.026	< 0.032	0.068	**420**
Phenanthrene	< 4.0	0.082	0.86	0.14	0.097	0.051	0.67	0.25	**NA**
Pyrene	< 2.0	< 0.034	0.56	0.078	0.07	0.071	< 0.49	0.39	**21,000**
RCRA Metals									
Arsenic	**3.3**	**5**	**6.9**	**6.8**	**25**	**2.5**	**14**	**4.9**	**3**
Barium	401	267	739	238	192	7.6	1,050	17	**14,000**
Cadmium	< 0.63	0.75	1.5	0.93	3.1	< 0.53	1.7	0.62	**200**
Chromium	14	128	9.8	50	59	5.4	64	15	**420**
Lead	23	27	24	43	48	7.6	33	18	**400**
Mercury	0.6	< 0.043	0.093	0.22	0.053	< 0.042	0.085	0.099	**61**
Selenium	< 0.31	< 0.27	< 0.28	< 0.27	0.7	< 0.26	0.92	< 0.31	**1,000**
Silver	< 2.5	< 2.1	< 2.3	< 2.2	< 2.4	< 2.1	< 2.6	< 2.5	**1,000**
Total PCBs	0.86	< 0.043	< 0.046	< 0.043	< 0.048	0.072	< 0.051	< 0.049	**1**
pH	7.97	8.50	7.24	7.95	8.03	9.34	8.02	8.66	**NA**

Notes:
Cleanup objectives were derived from Illinois Environmental Protection Agency Section 742 Appendix B-Table B Tier 1 Soil Remediation Objectives for Industrial/Commercial Properties

(1) NA indicates not applicable, cleanup objectives have not been established for these parameters.
(2) Results are shown as totals, therefore the soil component of the groundwater ingestion exposure route has not been considered

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Table 5
Groundwater Sampling
Groundwater Analytical Results in Milligrams per Liter (mg/l)
Commonwealth Edison Company - Waukegan Generating Station
10 Greenwood Avenue
Waukegan, Illinois

Sample I.D. Lab I.D. Sample Date	MW-11 500692 10/29/98	MW-2 (B-3) 500693 10/29/98	MW-3 (B-12) 500694 10/29/98	MW-12 500695 10/29/98	MW-5 (B-18) 500696 10/29/98	MW-6 (B-21) 500697 10/29/98	MW-7 (B-23) 500698 10/29/98	IEPA Groundwater (Class II) Cleanup Objectives
Parameters								
BTEX								
Benzene	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	0.0048	**0.025**
Toluene	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	**2.5**
Ethyl Benzene	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	**1.0**
Total Xylenes	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	**10.0**
PNAs								
Acenaphthene	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	**2.1**
Acenaphthylene	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	**NA[1]**
Anthracene	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	**10.5**
Benzo(a)anthracene	< 0.00013	< 0.00013	< 0.00013	< 0.00013	< 0.00013	< 0.00013	< 0.00013	**0.00065**
Benzo(a)pyrene	< 0.00023	< 0.00023	< 0.00023	< 0.00023	< 0.00023	< 0.00023	< 0.00023	**0.002**
Benzo(b)fluoranthene	< 0.00018	< 0.00018	< 0.00018	< 0.00018	< 0.00018	< 0.00018	< 0.00018	**0.0009**
Benzo(g,h,i)perylene	< 0.00076	< 0.00076	< 0.00076	< 0.00076	< 0.00076	< 0.00076	< 0.00076	**NA**
Benzo(k)fluoranthene	< 0.00017	< 0.00017	< 0.00017	< 0.00017	< 0.00017	< 0.00017	< 0.00017	**0.00085**
Chrysene	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	**0.0075**
Dibenzo(a,h)anthracene	< 0.00030	< 0.00030	< 0.00030	< 0.00030	< 0.00030	< 0.00030	< 0.00030	**0.0015**
Fluoranthene	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	**1.4**
Fluorene	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	**1.4**
Indeno(1,2,3-c,d)pyrene	< 0.00043	< 0.00043	< 0.00043	< 0.00043	< 0.00043	< 0.00043	< 0.00043	**0.00215**
Naphthalene	0.00056	0.00058	0.0011	0.00062	0.0012	< 0.0005	< 0.0005	**0.039**
Phenanthrene	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010	**NA**
Pyrene	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	**1.05**
RCRA Metals								
Arsenic	**1.1**	0.0073	< 0.0050	< 0.0050	< 0.0050	0.01	0.0072	**0.2**
Barium	0.031	0.07	0.085	0.048	0.104	0.292	0.151	**2.0**
Cadmium	0.034	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	**0.05**
Chromium	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	**1.0**
Lead	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	**0.1**
Mercury	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	**0.01**
Selenium	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	**0.05**
Silver	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	**0.05**
Total PCBs	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	**0.0025**
pH	7.07	7.03	6.80	6.65	6.88	7.06	7.37	**NA**
Specific Conductivity (mol)	169.5	131.0	142.3	81.2	133.4	54.9	124.5	**NA**
Temperature (C)	14.1	16.0	14.8	15.5	16.1	16.6	15.1	**NA**

Notes:
Cleanup objectives were derived from Illinois Environmental Protection Agency Section 742 Appendix B-Table E: Tier 1 Groundwater Remediation Objectives for the Groundwater Component of the Groundwater Ingestion Route

[1] NA indicates not applicable, cleanup objectives have not been established for these parameters.

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FIGURES

Phase II Environmental Site Assessment
Commonwealth Edison Company
December 7, 1998

Waukegan Generating Station
10 Greenwood Avenue
Waukegan, Illinois

MWG13-15_45812

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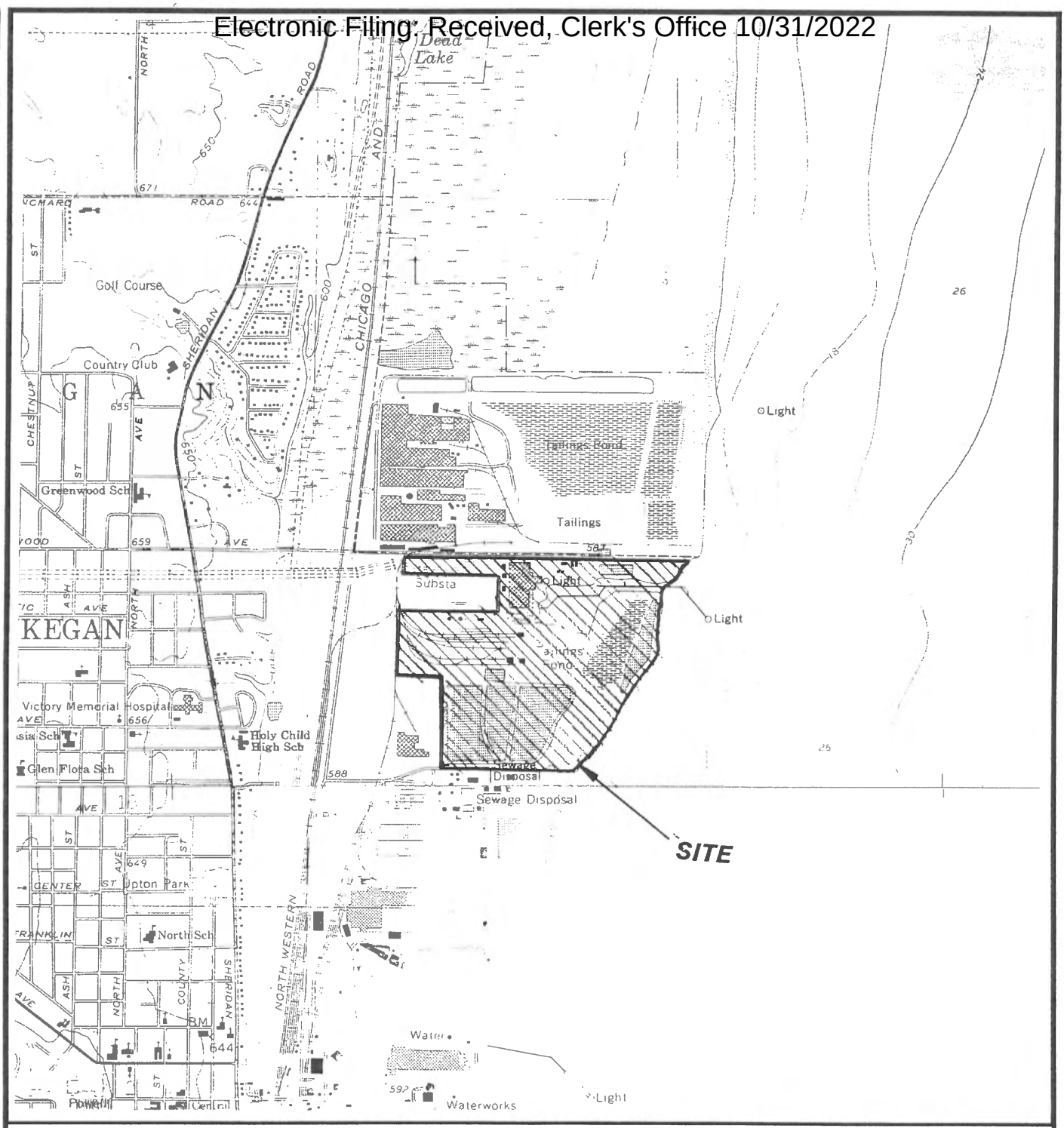


Dwg No: WAUKEGANSL1

N

U.S.G.S.
ZION, IL. &
WAUKEGAN, IL

SITE LOCATION MAP

WAUKEGAN GENERATING STATION
10 GREENWOOD AVENUE
WAUKEGAN, ILLINOIS

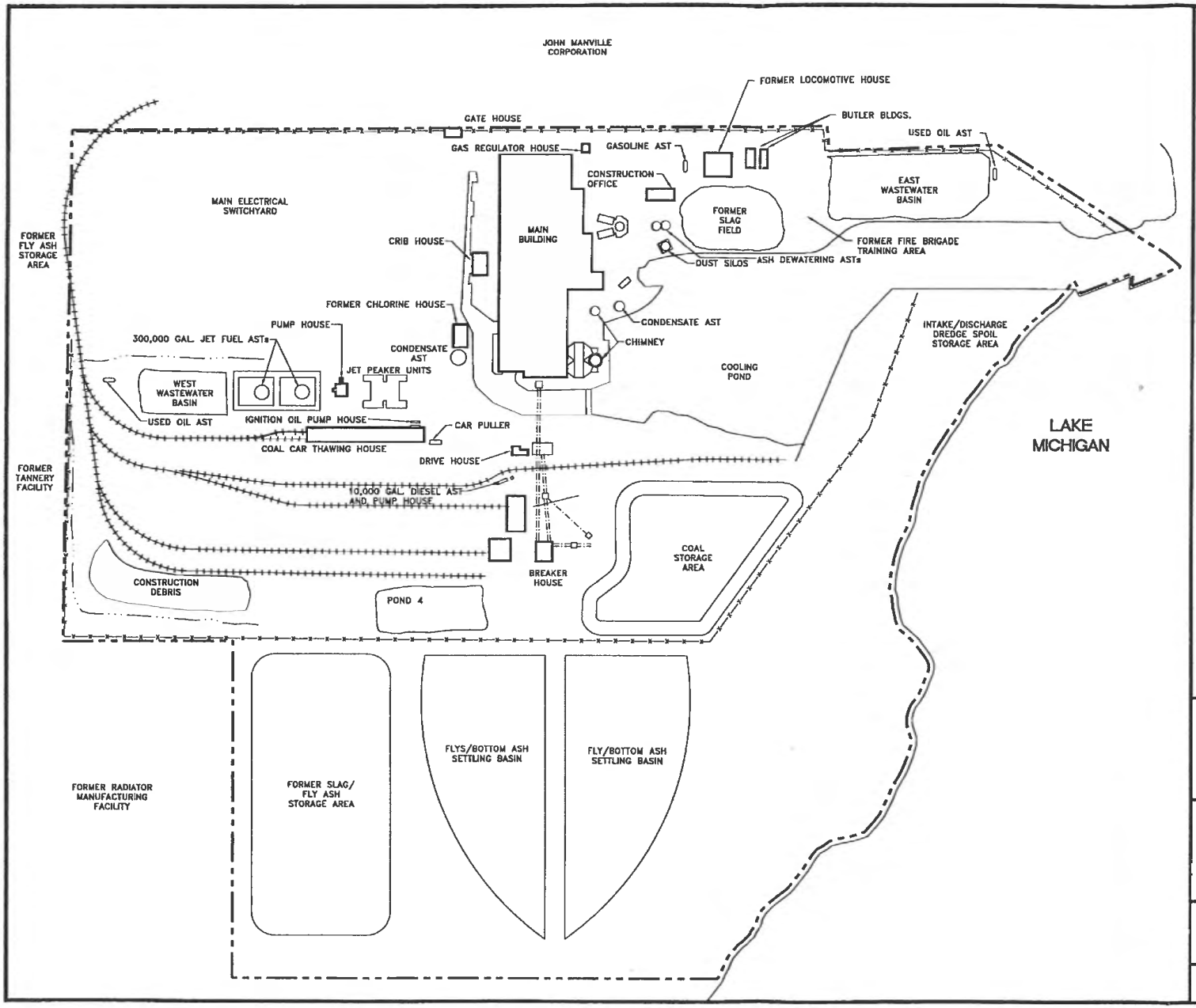
COMMONWEALTH EDISON COMPANY

November 1998 File No: 1801-023-610

FIGURE 1

ENSR

MWG13-15_45813



LEGEND:

- PROPERTY BOUNDARY
- RAILROAD LINE
- FENCE
- CONVEYOR LINE
- DRAINAGE DITCH

Note:
- All dimensions and locations are approximate.

Source:
- ENSR field observations.

Dwg No: WAUKEGANSP1

WAUKEGAN GENERATING STATION
10 GREENLAND AVENUE
WAUKEGAN, ILLINOIS

COMMONWEALTH EDISON COMPANY

November 1998 File No: 1801-023-010

SITE PLAN

N

NOT TO SCALE

FIGURE 2

ENSR

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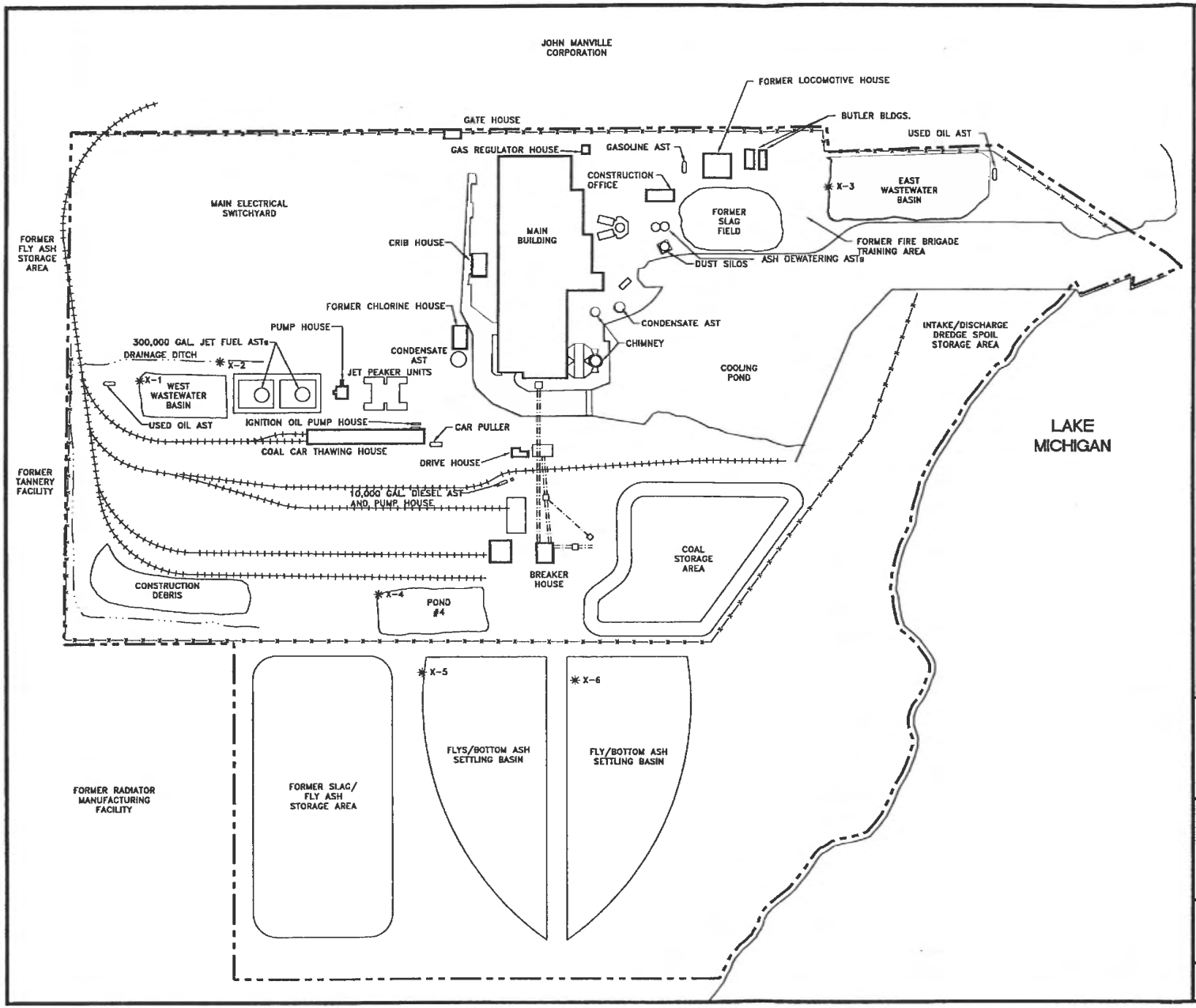
MWG13-15_45814



LEGEND:

- PROPERTY BOUNDARY
- RAILROAD LINE
- FENCE
- CONVEYOR LINE
- X-1 SEDIMENT SAMPLE

Note:
- All dimensions and locations are approximate.

Source:
- ENSR field observations.

Dwg No: WAUKEGAN11

WAUKEGAN GENERATING STATION
10 GREENLAND AVENUE
WAUKEGAN, ILLINOIS

COMMONWEALTH EDISON COMPANY

November 1998 File No: 1801-023-6

SEDIMENT SAMPLING SITE PLAN

N

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FIGURE 3

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MWG13-15_45815

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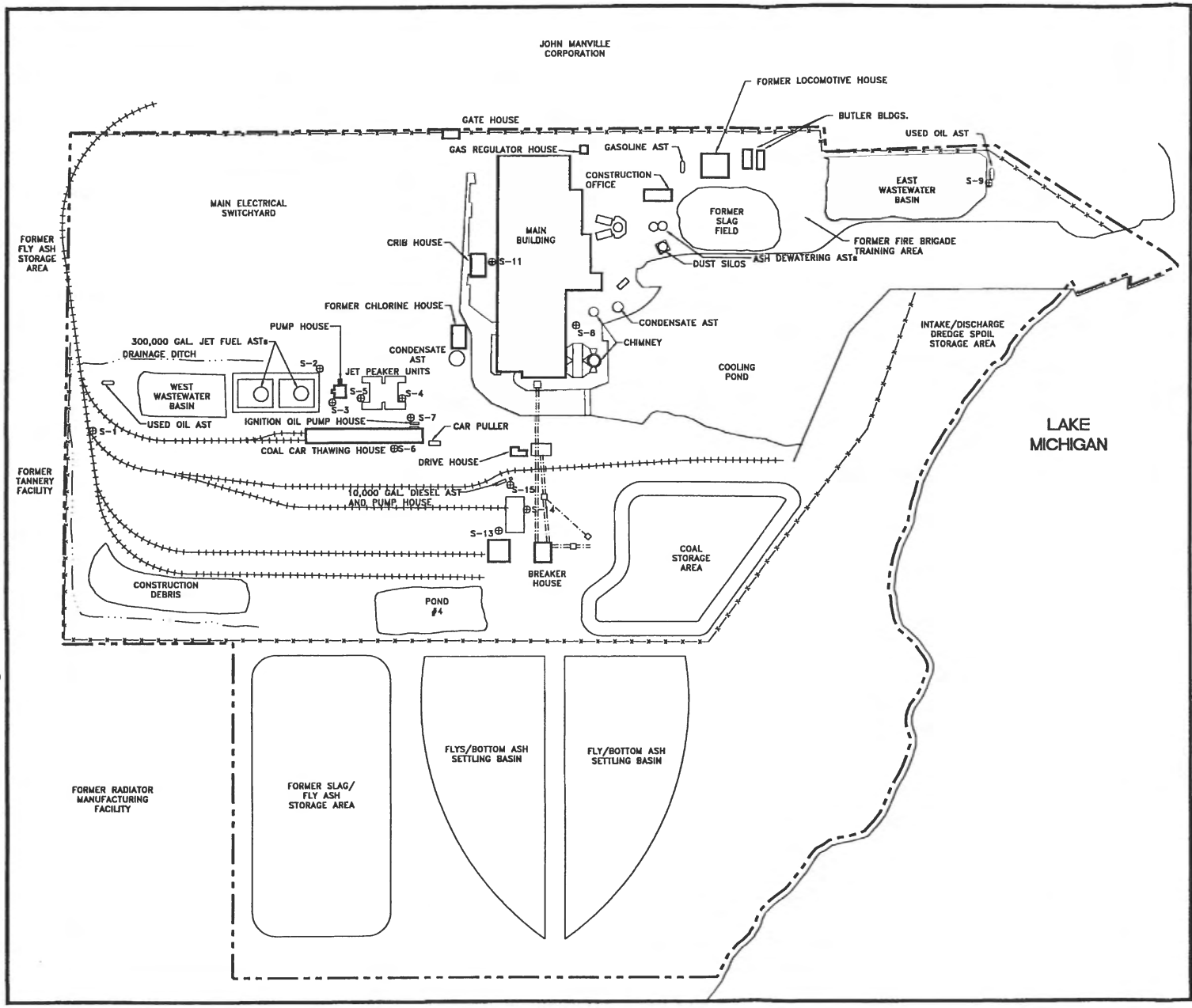


LEGEND:

- PROPERTY BOUNDARY
- RAILROAD LINE
- FENCE
- CONVEYOR LINE
- ⊕ S-1 SURFACE SOIL SAMPLE

Note:
- All dimensions and locations are approximate.

Source:
- ENSR field observations.

Dwg No: WAUKEGANSS2

WAUKEGAN GENERATING STATION
10 GREENLAND AVENUE
WAUKEGAN, ILLINOIS

COMMONWEALTH EDISON COMPANY

November 1998 File No: 1801-023-610

SURFACE SOIL SAMPLING SITE PLAN

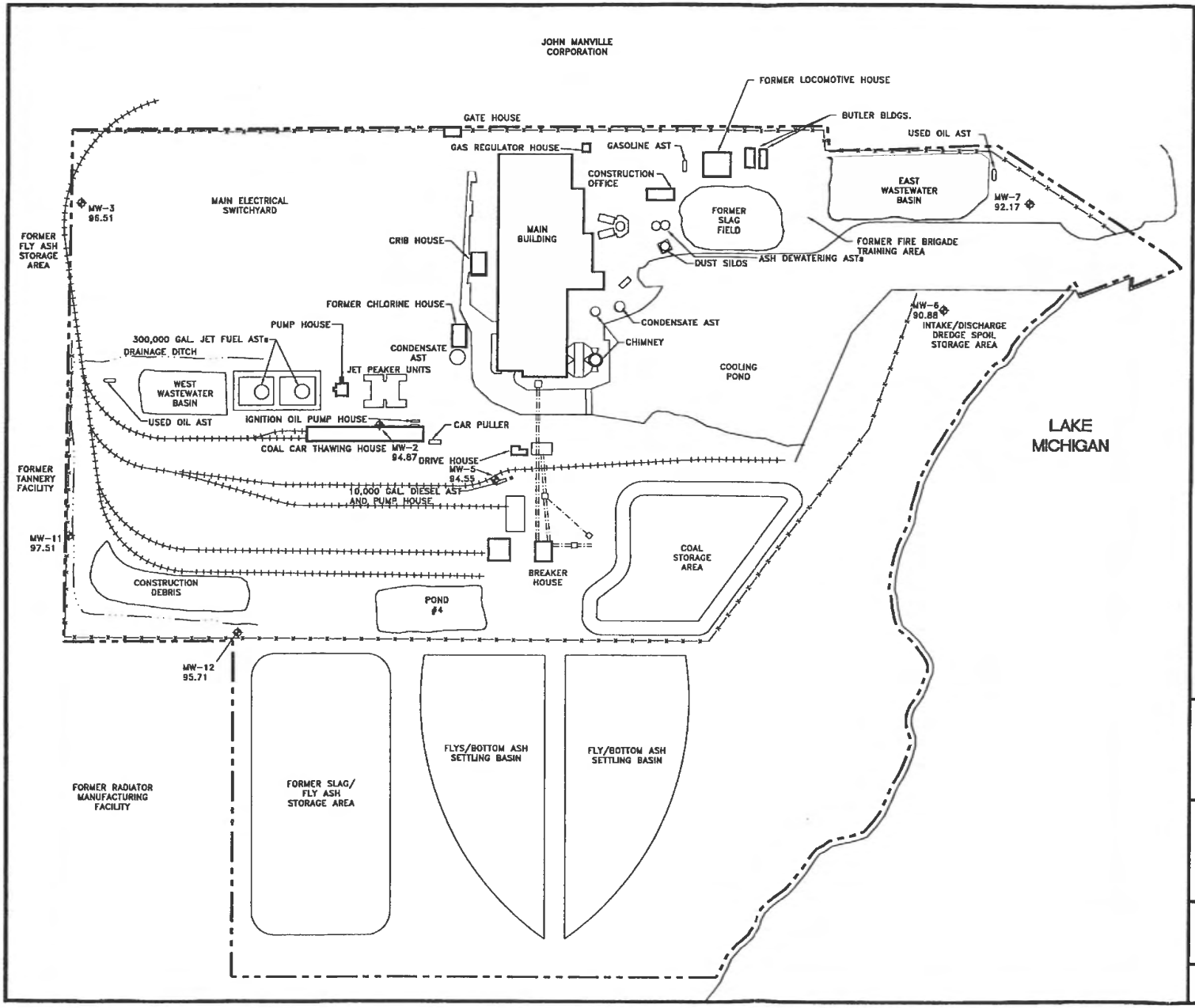
N

NOT TO SCALE

FIGURE 4

ENSR

MWG13-15_45816



LEGEND:

- PROPERTY BOUNDARY
- RAILROAD LINE
- FENCE
- CONVEYOR LINE
- MW-2 94.87 — MONITORING WELL WITH GROUND WATER ELEVATION IN FEET.

Note:
- All dimensions and locations are approximate.

Source:
- ENSR field observations.

Dwg No: WAUKEGGW1

WAUKEGAN GENERATING STATION
10 GREENLAND AVENUE
WAUKEGAN, ILLINOIS

COMMONWEALTH EDISON COMPANY

November 1998 File No: 1801-023-610

GROUNDWATER ELEVATION MAP

N

NOT TO SCALE

FIGURE 6

ENSR

MWG13-15_45818

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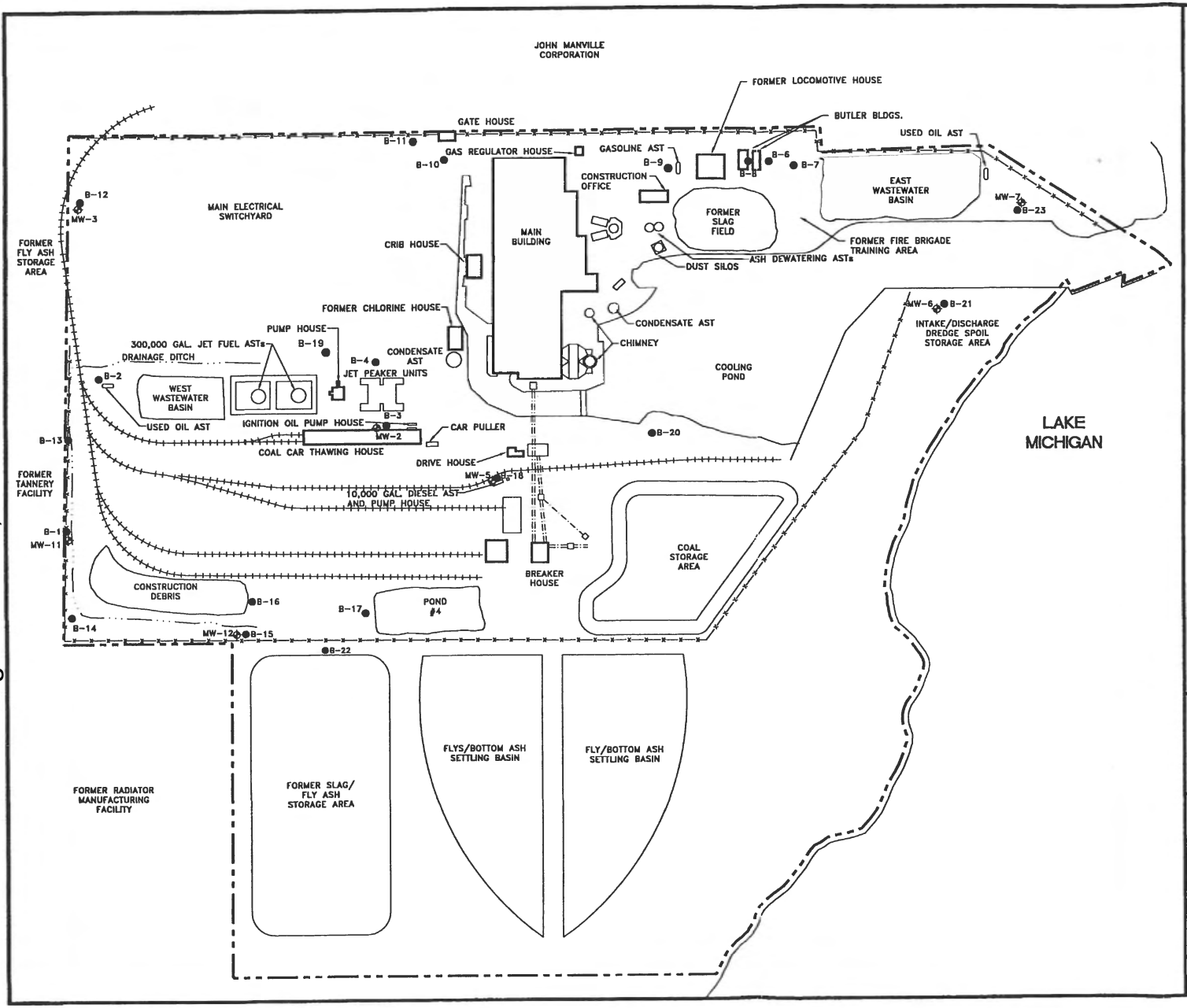

LEGEND:

- PROPERTY BOUNDARY
- RAILROAD LINE
- FENCE
- CONVEYOR LINE
- MW-2 MONITORING WELL
- B-1 SOIL BORING

Note:
- All dimensions and locations are approximate.

Source:
- ENSR field observations.

Dwg No: WAUKEGANSB1

WAUKEGAN GENERATING STATION
10 GREENLAND AVENUE
WAUKEGAN, ILLINOIS

COMMONWEALTH EDISON COMPANY

November 1998 File No: 1801-023-610

SOIL BORING/ MONITORING WELL SITE PLAN

FIGURE 5

N

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MWG13-15_45817

A

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APPENDIX A

Boring Logs and Monitoring Well Construction Diagrams

Phase II Environmental Site Assessment
Commonwealth Edison Company
December 7, 1998

Waukegan Generating Station
10 Greenwood Avenue
Waukegan, Illinois

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Log of Borehole B-1

Project No:1801-023-610

Project: Phase II Investigation

Client: Commonwealth Edison

Location: Waukegan Power Station

Geologist: BB

SUBSURFACE PROFILE			SAMPLE				
Depth	Symbol	Description / Classification	Number	Type	Recovery(%)	PID Reading	Lab Analysis
ft / m		Ground Surface					
0 / 0							
1		2' Light brown, medium grain, sand 2' Coal	1	GP	100	< 1	0 - 4 PNAs/BETX/pH/PCBs/ RCRA Metals
2							
3 / 1							
4		End of Borehole					
5							
6							
7 / 2							
8							
9							
10 / 3							
11							
12							
13 / 4							
14							
15							

Drilled By:Fox Drilling

Drill Method: **Geoprobe**

Drill Date: **10/29/98**

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Westmont, IL 60559
630-887-1700

Sheet: 1 of 1

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Log of Borehole B-2

Project No:1801-023-610

Project: Phase II Investigation

Client: Commonwealth Edison

Location: Waukegan Power Station

Geologist: BB

SUBSURFACE PROFILE			SAMPLE				
Depth (ft / m)	Symbol	Description / Classification	Number	Type	Recovery(%)	PID Reading	Lab Analysis
0 / 0		Ground Surface					
0 – 1 / 0 – 1		Light brown sand with gravel	1	GP	80	11.5	0 - 4 PNAs/BETX/pH/PCBs/ RCRA Metals
4 / 1		End of Borehole					
5 – 15 / 2 – 4							

Drilled By:Fox Drilling

Drill Method: **Geoprobe**

Drill Date: **10/29/98**

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Westmont, IL 60559
630-887-1700

Sheet: 1 of 1

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Log of Borehole B-3

Project No:1801-023-610

Project: Phase II Investigation

Client: Commonwealth Edison

Location: Waukegan Power Station

Geologist: BB

SUBSURFACE PROFILE			SAMPLE				
Depth (ft / m)	Symbol	Description / Classification	Number	Type	Recovery(%)	PID Reading	Lab Analysis
0 / 0		Ground Surface					
0 – 4 ft		Dark brown-black, sand, saturated	1	GP	100	18.7	0 - 4 PNA/BETX/pH/PCBs/ RCRA Metals
4 – 8 ft		Dark brown-black, sand, saturated	2	SS	100	15.6	
8 ft / 2 m		End of Borehole					

Drilled By:Fox Drilling

Drill Method: **Geoprobe**

Drill Date: **10/27/98**

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Log of Borehole B-4

Project No:1801-023-610

Project: Phase II Investigation

Client: Commonwealth Edison

Location: Waukegan Power Station

Geologist: BB

SUBSURFACE PROFILE			SAMPLE				
Depth	Symbol	Description / Classification	Number	Type	Recovery(%)	PID Reading	Lab Analysis
0 ft / 0 m		Ground Surface					
0 - 1 ft		1.5' Gravel 6" Clay and silt, wet with gravel 2' Orange black coal with sand	1	GP	100	4.2	0 - 4 PNA/BETX/pH/PCBs/ RCRA Metals
4 ft / 1 m		End of Borehole					
5 - 15 ft / 2 - 4 m							

Drilled By:Fox Drilling

Drill Method: **Geoprobe**

Drill Date: **10/26/98**

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Log of Borehole B-6

Project No:1801-023-610

Project: Phase II Investigation

Client: Commonwealth Edison

Location: Waukegan Power Station

Geologist: BB

SUBSURFACE PROFILE			SAMPLE				
Depth	Symbol	Description / Classification	Number	Type	Recovery(%)	PID Reading	Lab Analysis
ft m		Ground Surface					
0 0		.5' Gravel .5' Coal					
1		3' Light brown sand, medium grained, wet	1	GP	100	9.5	0 - 4 PNAs/BETX/pH/PCBs/ RCRA Metals
2							
3 1							
4		End of Borehole					
5							
6 2							
7							
8							
9							
10 3							
11							
12							
13 4							
14							
15							

Drilled By:Fox Drilling

Drill Method: **Geoprobe**

Drill Date: **10/29/98**

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Log of Borehole B-7

Project No:1801-023-610

Project: Phase II Investigation

Client: Commonwealth Edison

Location: Waukegan Power Station

Geologist: BB

SUBSURFACE PROFILE			SAMPLE				
Depth (ft / m)	Symbol	Description / Classification	Number	Type	Recovery(%)	PID Reading	Lab Analysis
0 / 0		Ground Surface					
1 2 3 / 1		1' Coal 2.5' Light brown, sand, medium grained, wet .5' Gray sand, medium grained, wet	1	GP	100	5.8	0 - 4 PNAs/BETX/pH/PCBs RCRA Metals
4 5 6 / 2		End of Borehole					
7 8 9 / 3							
10 11 12 / 4							
13 14 15							

Drilled By:Fox Drilling

Drill Method: **Geoprobe**

Drill Date: **10/29/98**

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Log of Borehole B-8

Project No:1801-023-610

Project: Phase II Investigation

Client: Commonwealth Edison

Location: Waukegan Power Station

Geologist: BB

SUBSURFACE PROFILE			SAMPLE				
Depth (ft / m)	Symbol	Description / Classification	Number	Type	Recovery(%)	PID Reading	Lab Analysis
0 / 0		Ground Surface					
		Coal to 2'					
1		2' Light brown, sand, moist to wet, with fines	1	GP	100	9.7	0 - 4 PNAs/BETX/pH/PCBs/ RCRA Metals
2 / 1							
3							
4		End of Borehole					
5							
6 / 2							
7							
8							
9							
10 / 3							
11							
12							
13 / 4							
14							
15							

Drilled By:Fox Drilling

Drill Method: **Geoprobe**

Drill Date: **10/29/98**

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Log of Borehole B-9

Project No:1801-023-610

Project: Phase II Investigation

Client: Commonwealth Edison

Location: Waukegan Power Station

Geologist: BB

SUBSURFACE PROFILE			SAMPLE				
Depth	Symbol	Description / Classification	Number	Type	Recovery(%)	PID Reading	Lab Analysis
ft m		Ground Surface					
0 0							
1		Coal to 3'					0 - 4
2		1' Light brown, sand, wet	1	GP	100	10.8	PNAS/BETX/PCBs
3 1							RCRA Metals
4		End of Borehole					
5							
6 2							
7							
8							
9							
10 3							
11							
12							
13 4							
14							
15							

Drilled By:Fox Drilling

Drill Method: **Geoprobe**

Drill Date: **10/29/98**

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Log of Borehole B-10

Project No:1801-023-610

Project: Phase II Investigation

Client: Commonwealth Edison

Location: Waukegan Power Station

Geologist: BB

SUBSURFACE PROFILE			SAMPLE				
Depth (ft / m)	Symbol	Description / Classification	Number	Type	Recovery(%)	PID Reading	Lab Analysis
0 / 0		Ground Surface					
1		Coal to 2' 6" Brown sandy clay 1' Light brown sand, fine to medium grained	1	GP	80	9.0	0 - 4 PNAs/BETX/pH/PCBs/ RCRA Metals
2 / 1							
3							
4							
5		Light brown sand, fine grained, wet with 1" gravel seam at 7'	2	SS	75	9.6	
6 / 2							
7							
8		End of Borehole					
9							
10 / 3							
11							
12							
13 / 4							
14							
15							

Drilled By:Fox Drilling

Drill Method: **Geoprobe**

Drill Date: **10/29/98**

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Log of Borehole B-11

Project No:1801-023-610

Project: Phase II Investigation

Client: Commonwealth Edison

Location: Waukegan Power Station

Geologist: BB

SUBSURFACE PROFILE			SAMPLE				
Depth	Symbol	Description / Classification	Number	Type	Recovery(%)	PID Reading	Lab Analysis
0 ft / 0 m		Ground Surface					
		6" Gravel 2.5' Coal slag with sand	1	GP	100	8.5	0 - 4 PNAs/BETX/pH/PCBs/ RCRA Metals
4 / 1		End of Borehole					
5							
6 / 2							
7							
8							
9 / 3							
10							
11							
12							
13 / 4							
14							
15							

Drilled By:Fox Drilling

Drill Method: **Geoprobe**

Drill Date: **10/29/98**

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Log of Borehole B-12

Project No:1801-023-610

Project: Phase II Investigation

Client: Commonwealth Edison

Location: Waukegan Power Station

Geologist: BB

SUBSURFACE PROFILE			SAMPLE				
Depth (ft / m)	Symbol	Description / Classification	Number	Type	Recovery(%)	PID Reading	Lab Analysis
0 / 0		Ground Surface					
		Borehole not logged.	1	GP	100	12.3	0 - 4 PNAs/BETX/pH/PCBs/ RCRA Metals
8 / 2		End of Borehole					
15 / 4							

Drilled By:Fox Drilling

Drill Method: Geoprobe

Drill Date: 10/28/98

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Log of Borehole B-13

Project No:1801-023-610

Project: Phase II Investigation

Client: Commonwealth Edison

Location: Waukegan Power Station

Geologist: BB

SUBSURFACE PROFILE			SAMPLE				
Depth	Symbol	Description / Classification	Number	Type	Recovery(%)	PID Reading	Lab Analysis
ft m 0 0		Ground Surface					
1 2 3 1		Coal with fine gravel bottom 1.5' wet	1	GP	60	1.4	0 - 4 PNAs/BETX/pH/PCBs/ RCRA Metals
4 5 6 2 7 8 9 10 3 11 12 13 4 14 15		End of Borehole					

Drilled By:Fox Drilling

Drill Method: **Geoprobe**

Drill Date: **10/26/98**

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Log of Borehole B-14

Project No:1801-023-610

Project: Phase II Investigation

Client: Commonwealth Edison

Location: Waukegan Power Station

Geologist: BB

SUBSURFACE PROFILE			SAMPLE				
Depth	Symbol	Description / Classification	Number	Type	Recovery(%)	PID Reading	Lab Analysis
ft m		Ground Surface					
0 0							
1		3' Wet coal Sand and gravel saturated	1	GP	100	1.4	0 - 4 PNAs/BETX/pH/PCBs/ RCRA Metals
2 1							
3							
4		End of Borehole					
5							
6 2							
7							
8							
9							
10 3							
11							
12							
13 4							
14							
15							

Drilled By:Fox Drilling

Drill Method: **Geoprobe**

Drill Date: **10/26/98**

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Log of Borehole B-15

Project No:1801-023-610

Project: Phase II Investigation

Client: Commonwealth Edison

Location: Waukegan Power Station

Geologist: BB

SUBSURFACE PROFILE			SAMPLE				
Depth (ft / m)	Symbol	Description / Classification	Number	Type	Recovery(%)	PID Reading	Lab Analysis
0 / 0		Ground Surface					
1 2 3 / 1 4		2' Coal 2' Light brown, medium grain, sand, wet	1	GP	100	< 1	0 - 4 PNAs/BETX/pH/PCBs/ RCRA Metals
5 6 7 / 2 8 9 10 / 3 11 12 13 / 4 14 15		End of Borehole					

Drilled By:Fox Drilling

Drill Method: **Geoprobe**

Drill Date: **10/29/98**

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Log of Borehole B-16

Project No:1801-023-610

Project: Phase II Investigation

Client: Commonwealth Edison

Location: Waukegan Power Station

Geologist: BB

SUBSURFACE PROFILE			SAMPLE				
Depth	Symbol	Description / Classification	Number	Type	Recovery(%)	PID Reading	Lab Analysis
ft m		Ground Surface					
0 0							0 - 2
1		Coal/Slag	1	GP	50	2.3	PNAs/BETX/pH/PCBs/ RCRA Metals
2							
3 1		End of Borehole					
4							
5							
6 2							
7							
8							
9							
10 3							
11							
12							
13 4							
14							
15							

Drilled By:Fox Drilling

Drill Method: **Geoprobe**

Drill Date: **10/26/98**

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Log of Borehole B-17

Project No:1801-023-610

Project: Phase II Investigation

Client: Commonwealth Edison

Location: Waukegan Power Station

Geologist: BB

SUBSURFACE PROFILE			SAMPLE				
Depth (ft / m)	Symbol	Description / Classification	Number	Type	Recovery(%)	PID Reading	Lab Analysis
0 / 0		Ground Surface					
1		1' Coal					
		1' Light brown-black, medium grain, sand					0 - 4 PNAs/BETX/pH/PCBs/ RCRA Metals
2		2' Coal	1	GP	100	5.4	
3 / 1							
4		End of Borehole					
5							
6 / 2							
7							
8							
9							
10 / 3							
11							
12							
13 / 4							
14							
15							

Drilled By:Fox Drilling

Drill Method: **Geoprobe**

Drill Date: **10/29/98**

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Log of Borehole B-18

Project No:1801-023-610

Project: Phase II Investigation

Client: Commonwealth Edison

Location: Waukegan Power Station

Geologist: BB

SUBSURFACE PROFILE			SAMPLE				
Depth	Symbol	Description / Classification	Number	Type	Recovery(%)	PID Reading	Lab Analysis
ft m		Ground Surface					
0 0		Brown-black sand, with odor					
1		saturated	1	GP	100	123	0 - 4 PNAs/BETX/pH/PCBs/ RCRA Metals
2							
3 1							
4		End of Borehole					
5							
6							
7 2							
8							
9							
10 3							
11							
12							
13 4							
14							
15							

Drilled By:Fox Drilling

Drill Method: **Geoprobe**

Drill Date: **10/27/98**

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Log of Borehole B-19

Project No:1801-023-610

Project: Phase II Investigation

Client: Commonwealth Edison

Location: Waukegan Power Station

Geologist: BB

SUBSURFACE PROFILE			SAMPLE				
Depth (ft / m)	Symbol	Description / Classification	Number	Type	Recovery(%)	PID Reading	Lab Analysis
0 / 0		Ground Surface					
1 2 3 / 1		1' Loose sand and coal 1' Rusty orange caol consolidated Coal, moist to wet	1	GP	75	19.3	0 - 4 PNAs/BETX/pH/PCBs/ RCRA Metals
4 5 6 / 2 7 8 9 10 / 3 11 12 13 / 4 14 15		End of Borehole					

Drilled By:Fox Drilling

Drill Method: **Geoprobe**

Drill Date: **10/26/98**

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Log of Borehole B-20

Project No:1801-023-610

Project: Phase II Investigation

Client: Commonwealth Edison

Location: Waukegan Power Station

Geologist: BB

SUBSURFACE PROFILE			SAMPLE				
Depth	Symbol	Description / Classification	Number	Type	Recovery(%)	PID Reading	Lab Analysis
ft m		Ground Surface					
0 0							
1		Black coal consolidated .5' Sand and gravel seam at 2.5' Same with silt, wet at 3.5'	1	GP	100	19.4	0 - 4 PNAs/BETX/pH/PCBs/ RCRA Metals
2 1							
3							
4		Black coal, consolidated, moist	2	GP	50	16.0	
5							
6 2		End of Borehole					
7							
8							
9							
10 3							
11							
12							
13 4							
14							
15							

Drilled By:Fox Drilling

Drill Method: Geoprobe

Drill Date: 10/26/98

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Log of Borehole B-21

Project No:1801-023-610

Project: Phase II Investigation

Client: Commonwealth Edison

Location: Waukegan Power Station

Geologist: BB

SUBSURFACE PROFILE			SAMPLE				
Depth	Symbol	Description / Classification	Number	Type	Recovery(%)	PID Reading	Lab Analysis
ft m 0 0		Ground Surface					
		Sand, medium grained, dry to moist, loose 1' Sand, medium grained, wet	1	GP	80	16.4	0 - 4 PNAs/BETX/pH/PCBs/ RCRA Metals
4 1		Light brown-gray, sand, medium grained, wet	2	GP	20	20.3	
6 2		End of Borehole					
10 3							
13 4							
15							

Drilled By:Fox Drilling

Drill Method: **Geoprobe**

Drill Date: **10/26/98**

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Log of Borehole B-22

Project No:1801-023-610

Project: Phase II Investigation

Client: Commonwealth Edison

Location: Waukegan Power Station

Geologist: BB

SUBSURFACE PROFILE			SAMPLE				
Depth (ft / m)	Symbol	Description / Classification	Number	Type	Recovery(%)	PID Reading	Lab Analysis
0 / 0		Ground Surface					
0 – 1		Coal and gray coal ash	1	GP	30	< 1	0 - 2 PNAs/BETX/pH/PCBs/ RCRA Metals
1 / 2		End of Borehole					
2 / 3							
3 / 4							
4 / 5							
5 / 6							
6 / 7							
7 / 8							
8 / 9							
9 / 10							
10 / 11							
11 / 12							
12 / 13							
13 / 14							
14 / 15							

Drilled By:Fox Drilling

Drill Method: **Geoprobe**

Drill Date: **10/26/98**

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Log of Borehole B-23

Project No:1801-023-610

Project: Phase II Investigation

Client: Commonwealth Edison

Location: Waukegan Power Station

Geologist: BB

SUBSURFACE PROFILE			SAMPLE				
Depth	Symbol	Description / Classification	Number	Type	Recovery(%)	PID Reading	Lab Analysis
ft m		Ground Surface					
0 0		Light brown sand, loose, with gravel 2' Same, wet	1	GP	100	12.4	0 - 4 PNAs/BETX/pH/PCBs/ RCRA Metals
4 1		End of Borehole					
8 2							
12 3							
15 4							

Drilled By:Fox Drilling

Drill Method: **Geoprobe**

Drill Date: **10/27/98**

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MWG13-15_45842

Electronic Filing: Received, Clerk's Office 10/31/2022

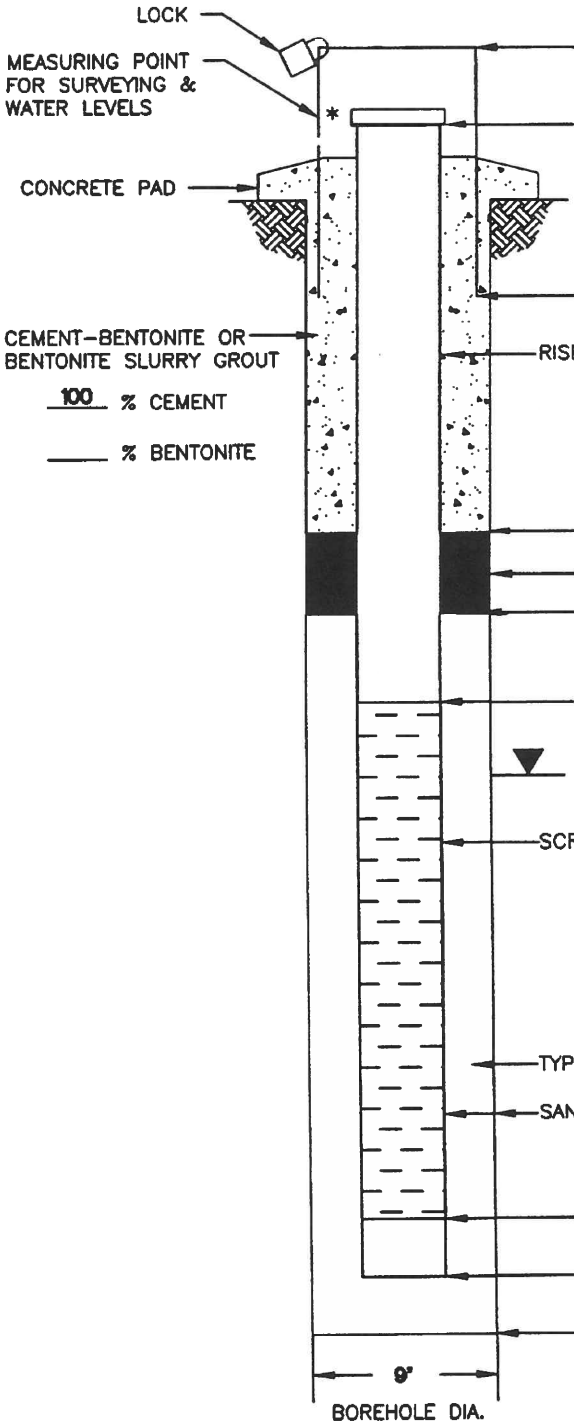
Project No: 1801-023-610 Client: Commonwealth Edison Site: Waukegan Power Station

WELL No: MW-2/B-3

Well Location: S. of Peakers and North of Coal Car Thawing Date Installed: 10/27/98

Contractor: FOX DRILLING INC. Method: HSA 4 1/4" Inspector: B. Buckley

MONITORING WELL CONSTRUCTION DETAIL



	DEPTH FROM G.S. (feet)	ELEVATION (NGVD)
TOP OF STEEL GUARD	0.00	96.98
TOP OF RISER PIPE	0.40	96.58
GROUND SURFACE (G.S.)	0.00	96.98
BOTTOM OF STEEL GUARD	0.67	96.31
RISER PIPE: LENGTH 2.6		
INSIDE DIAMETER (ID) 2.07		
TYPE OF MATERIAL PVC Sch. 40		
TOP OF BENTONITE SEAL	1.0	95.98
BENTONITE SEAL THICKNESS	2.0	94.98
TOP OF SAND	3.0	93.98
TOP OF SCREEN	3.0	93.98
STABILIZED WATER LEVEL	1.71 (2.11 FROM G.S.)	94.87
SCREEN: LENGTH 5.0		
INSIDE DIAMETER (ID) 2.07"		
SLOT SIZE 0.010		
TYPE OF MATERIAL PVC Sch40		
TYPE/SIZE OF SAND Otz #5		
SAND PACK THICKNESS 3.0"		
BOTTOM OF SCREEN	7.83	89.15
BOTTOM OF TAILPIPE LENGTH 2"	7.83	89.15
BOTTOM OF BOREHOLE	8.0	88.98

* Describe Measuring Point

NORTH SIDE

Approved:

Signature

10/27/98
Date

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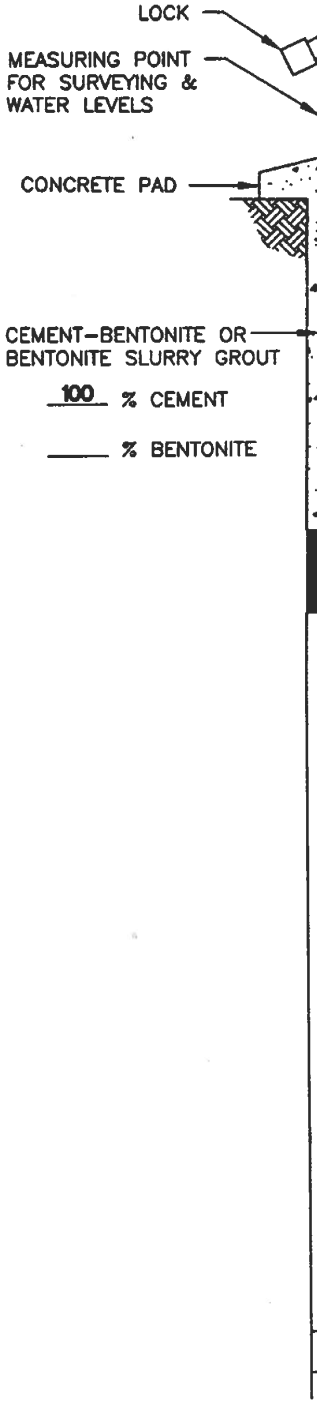
Project No: 1901-023-610 Client: Commonwealth Edison Site: Waukegan Power Station

WELL No: MW-3/B-12

Well Location: NW corner of property, under High Tension Wires Date Installed: 10/28/98

Contractor: FOX DRILLING INC. Method: HSA 4 1/4" Inspector: B. Buckley

MONITORING WELL CONSTRUCTION DETAIL



	DEPTH FROM G.S. (feet)	ELEVATION (NGVD)
TOP OF STEEL GUARD	0.00	98.19
TOP OF RISER PIPE	0.38	97.81
GROUND SURFACE (G.S.)	0.00	98.19
BOTTOM OF STEEL GUARD	0.67	97.52
RISER PIPE: LENGTH 2.62; INSIDE DIAMETER (ID) 2.07; TYPE OF MATERIAL PVC Sch. 40		
TOP OF BENTONITE SEAL	1.0	97.19
BENTONITE SEAL THICKNESS	2.0	96.19
TOP OF SAND	3.0	95.19
TOP OF SCREEN	3.0	95.19
STABILIZED WATER LEVEL	1.3 (1.68 FROM G.S.)	96.51
SCREEN: LENGTH 5.0; INSIDE DIAMETER (ID) 2.07"; SLOT SIZE 0.010; TYPE OF MATERIAL PVC Sch.40		
TYPE/SIZE OF SAND Otz.#5		
SAND PACK THICKNESS 3.0"		
BOTTOM OF SCREEN	7.83	90.36
BOTTOM OF TAILPIPE LENGTH 2"	7.83	90.36
BOTTOM OF BOREHOLE	8.0	90.19

* Describe Measuring Point

NORTH SIDE

Approved:

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10/28/98
Date

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MWG13-15_45844
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Project No: 1901-023-610 Client: Commonwealth Edison Site: Waukegan Power Station

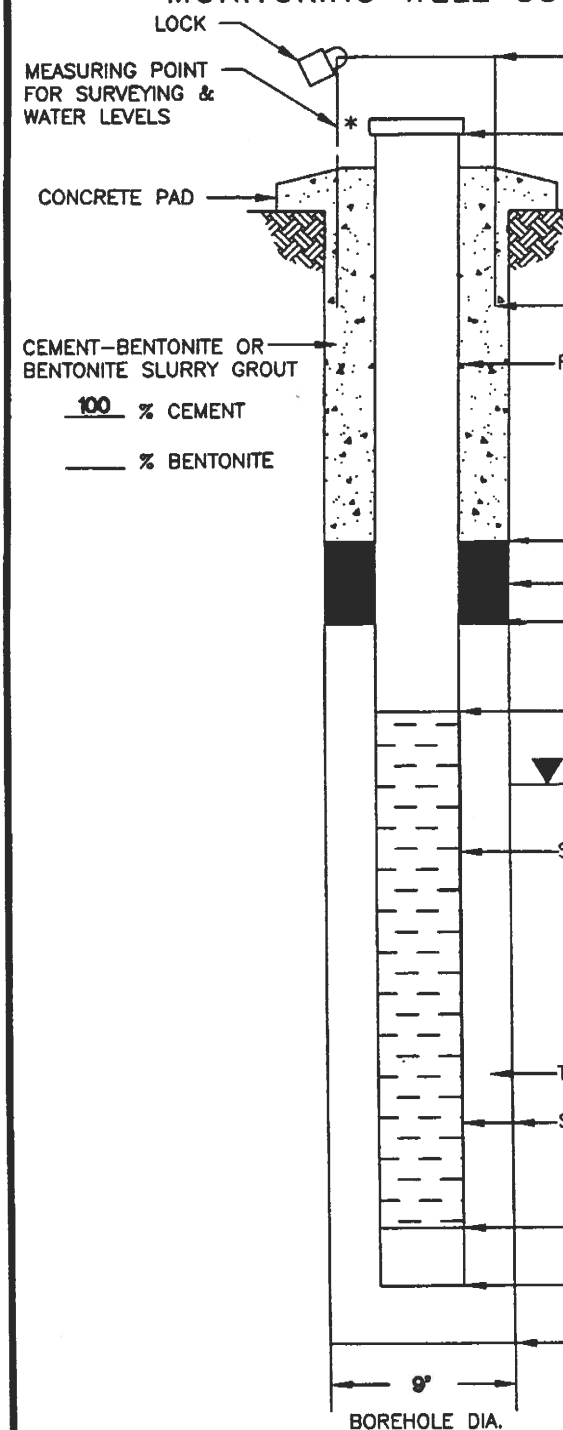
WELL No: MW-5/B-18

Well Location: Near Coal Hopper Control Building, near AST

Date Installed: 10/27/98

Contractor: FOX DRILLING INC. Method: HSA 4 1/4" Inspector: B. Buckley

MONITORING WELL CONSTRUCTION DETAIL



	DEPTH FROM G.S. (feet)	ELEVATION (NGVD)
TOP OF STEEL GUARD	0.00	98.56
TOP OF RISER PIPE	0.32	98.24
GROUND SURFACE (G.S.)	0.00	98.56
BOTTOM OF STEEL GUARD	0.67	97.89
RISER PIPE: LENGTH 2.68		
INSIDE DIAMETER (ID) 2.07		
TYPE OF MATERIAL PVC Sch. 40		
TOP OF BENTONITE SEAL	1.0	97.56
BENTONITE SEAL THICKNESS	2.0	96.56
TOP OF SAND	3.0	95.56
TOP OF SCREEN	3.0	95.56
STABILIZED WATER LEVEL	3.69 (4.01 FROM G.S.)	94.55
SCREEN: LENGTH 5.0		
INSIDE DIAMETER (ID) 2.07"		
SLOT SIZE 0.010		
TYPE OF MATERIAL PVC Sch.40		
TYPE/SIZE OF SAND Otz.#5		
SAND PACK THICKNESS 3.0"		
BOTTOM OF SCREEN	7.83	90.73
BOTTOM OF TAILPIPE LENGTH 2"	7.83	90.73
BOTTOM OF BOREHOLE	8.0	90.56

* Describe Measuring Point

NORTH SIDE

Approved:

Signature

10/27/98
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Project No: 1901-023-610 Client: Commonwealth Edison Site: Waukegan Power Station

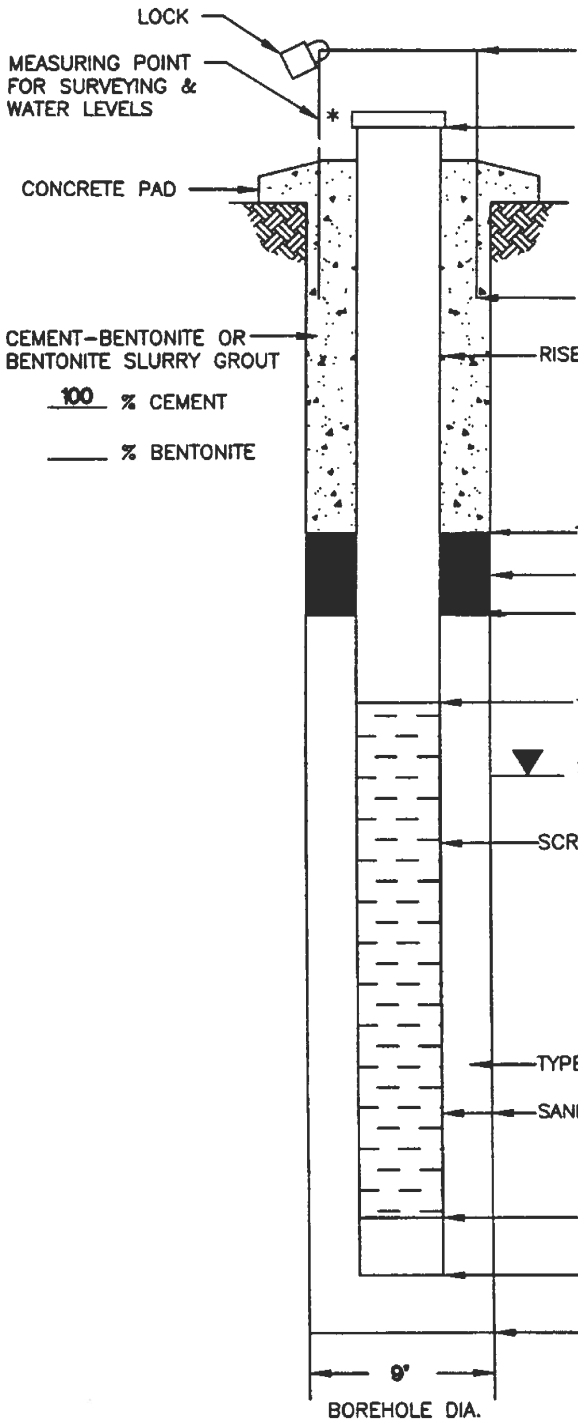
WELL No: MW-6/B-21

Well Location: East of Cooling Pond near Beach

Date Installed: 10/27/98

Contractor: FOX DRILLING INC. Method: HSA 4 1/4" Inspector: B. Buckley

MONITORING WELL CONSTRUCTION DETAIL



	DEPTH FROM G.S. (feet)	ELEVATION (NGVD)
TOP OF STEEL GUARD	0.00	98.65
TOP OF RISER PIPE	0.29	98.36
GROUND SURFACE (G.S.)	0.00	98.65
BOTTOM OF STEEL GUARD	0.67	97.98
RISER PIPE: LENGTH 4.71; INSIDE DIAMETER (ID) 2.07; TYPE OF MATERIAL PVC Sch. 40		
TOP OF BENTONITE SEAL	1.0	97.65
BENTONITE SEAL THICKNESS	3.0	96.15
TOP OF SAND	4.0	94.65
TOP OF SCREEN	5.0	93.65
STABILIZED WATER LEVEL	7.48 (7.69 FROM G.S.)	90.96
SCREEN: LENGTH 4.0; INSIDE DIAMETER (ID) 2.07"; SLOT SIZE 0.010; TYPE OF MATERIAL PVC Sch.40		
TYPE/SIZE OF SAND	Otz.#5	
SAND PACK THICKNESS	3.0"	
BOTTOM OF SCREEN	9.83	88.82
BOTTOM OF TAILPIPE LENGTH 2"	9.83	88.82
BOTTOM OF BOREHOLE	10	88.65

* Describe Measuring Point

NORTH SIDE

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10/27/98
Date

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Project No: 1901-023-610 Client: Commonwealth Edison Site: Waukegan Power Station

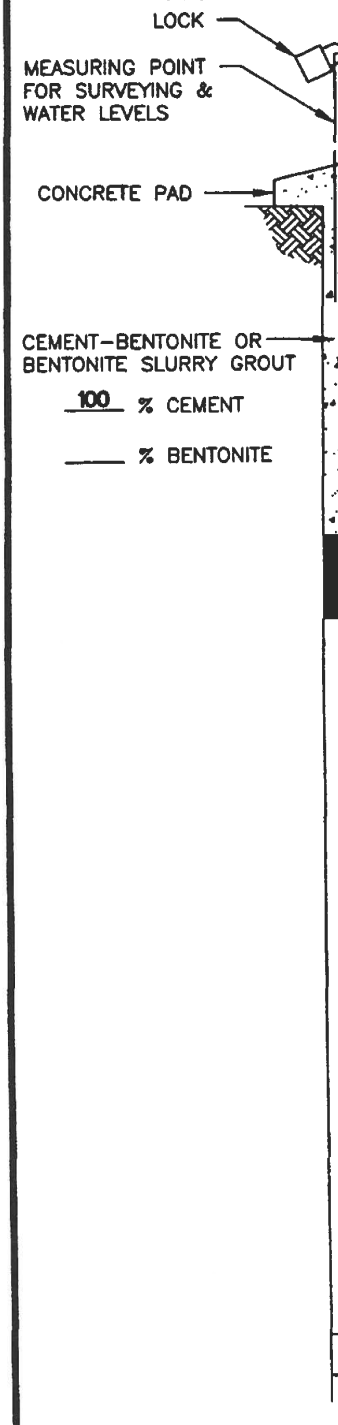
WELL No: MW-7/B-23

Well Location: East of Waste Oil in Fishing Area

Date Installed: 10/27/98

Contractor: FOX DRILLING INC. Method: HSA 4 1/4" Inspector: B. Buckley

MONITORING WELL CONSTRUCTION DETAIL



	DEPTH FROM G.S. (feet)	ELEVATION (NGVD)
TOP OF STEEL GUARD	0.00	96.66
TOP OF RISER PIPE	0.24	96.42
GROUND SURFACE (G.S.)	0.00	96.66
BOTTOM OF STEEL GUARD	0.67	95.99
RISER PIPE: LENGTH 4.26; INSIDE DIAMETER (ID) 2.07; TYPE OF MATERIAL PVC Sch. 40		
TOP OF BENTONITE SEAL	1.0	95.66
BENTONITE SEAL THICKNESS	3.5	93.91
TOP OF SAND	4.5	92.16
TOP OF SCREEN	5.0	91.66
STABILIZED WATER LEVEL	4.25 (4.49 FROM G.S.)	92.17
SCREEN: LENGTH 5.0; INSIDE DIAMETER (ID) 2.07"; SLOT SIZE 0.010; TYPE OF MATERIAL PVC Sch.40		
TYPE/SIZE OF SAND	Otz.#5	
SAND PACK THICKNESS	3.0"	
BOTTOM OF SCREEN	9.83	86.83
BOTTOM OF TAILPIPE LENGTH 2"	9.83	86.83
BOTTOM OF BOREHOLE	10	86.66

* Describe Measuring Point

NORTH SIDE

Approved:

Signature

10/27/98
Date

ENSR™

MWG13-15_45847

B

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APPENDIX B

Analytical Reports

Phase II Environmental Site Assessment
Commonwealth Edison Company
December 7, 1998

Waukegan Generating Station
10 Greenwood Avenue
Waukegan, Illinois

r:chhicago\project\h171\comed\fossil\waukegan\phase2 doc

NATIONAL ENVIRONMENTAL TESTING, INC.

Bartlett Division
850 West Bartlett Rd.
Bartlett, IL 60103
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Rockford Division
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Fax: (815) 874-5622
(800) 807-2877

Mr. Wei-Lin Feng
ENSR
740 Pasquinelli Drive
Westmont, IL 60559

11/10/1998

NET Job Number: 98.13879

IEPA Cert. No.: 100221
WDNR Cert. No.: 999447130
A2LA Cert. No.: 0453-01

Enclosed is the Analytical and Quality Control reports for the following samples submitted to Bartlett Division of NET, Inc. for analysis.

Project Description: ComEd-Waukegan; 1801-023-610

Sample Number	Sample Description	Date Taken	Date Received
499912	B21 (0-4)	10/26/1998	10/27/1998
499913	B20 (0-4)	10/26/1998	10/27/1998
499914	B19 (0-4)	10/26/1998	10/27/1998
499915	B4 (0-4)	10/26/1998	10/27/1998
499916	B2 (0-4)	10/26/1998	10/27/1998
499917	B13 (0-4)	10/26/1998	10/27/1998
499918	B14 (0-4)	10/26/1998	10/27/1998
499919	B16 (0-4)	10/26/1998	10/27/1998
499920	B22 (0-2)	10/26/1998	10/27/1998
499921	S1	10/26/1998	10/27/1998

Sample analysis in support of the project referenced above has been completed and results are presented on the following pages. These results apply only to the samples analyzed. Reproduction of this report only in whole is permitted. Please refer to the enclosed "Key to Abbreviations" for definition of terms. Procedures used follow NET Standard Operating Procedures which reference the methods listed on your report. Should you have questions regarding procedures or results, please do not hesitate to call. NET has been pleased to provide these analytical services for you.

This Quality Control report is generated on a batch basis. All information contained in this report is for the analytical batch(es) in which your sample(s) were analyzed.

Approved by:

Mary Pearson
Project Manager

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ANALYTICAL REPORT

Mr. Wei-Lin Feng
ENSR
740 Pasquinelli Drive
Westmont, IL 60559

11/10/1998

Sample No. : 499912

NET Job No.: 98.13879

Sample Description: B21 (0-4)
ComEd-Waukegan; 1801-023-610

Date Taken: 10/26/1998
Time Taken: 10:15
IEPA Cert. No. 100221

Date Received: 10/27/1998
Time Received: 11:00
WDNR Cert. No. 999447130

Parameter	Results	Units	Date of Analysis	Method PQL	Analyst	Batch No. Prep/Run		Analytical Method
pH, Non-Aqueous	9.34	units	10/30/1998	0.10	nwg		188	SW 9045B
Solids, Total	95.0	%	11/02/1998	0.1	efw		2515	SM 2540
Arsenic, GFAA	2.5	mg/kg dw	11/06/1998	0.53	mhp	235	672	SW 7060
Barium, ICP	7.6	mg/kg dw	11/06/1998	1.1	jtt	1165	2188	SW 6010B
Cadmium, ICP	<0.53	mg/kg dw	11/06/1998	0.53	jtt	1165	2174	SW 6010B
Chromium, ICP	5.4	mg/kg dw	11/06/1998	2.1	jtt	1165	2159	SW 6010B
Lead, ICP	7.6	mg/kg dw	11/06/1998	4.2	jtt	1165	2397	SW 6010B
Mercury, CVAA	<0.042	mg/kg dw	11/02/1998	0.042	sep	665	769	SW 7471A
Selenium, GFAA	<0.26	mg/kg dw	11/07/1998	0.26	mhp	235	561	SW 7740
Silver, AA	<2.1	mg/kg dw	11/02/1998	2.1	sep	492	569	SW 7760
UST VOLATILES NON-AQUEOUS								
Benzene	<0.005	mg/kg dw	11/03/1998	0.005	jap		74	SW 8260A
Ethylbenzene	<0.005	mg/kg dw	11/03/1998	0.005	jap		74	SW 8260A
Toluene	<0.005	mg/kg dw	11/03/1998	0.005	jap		74	SW 8260A
Xylenes, Total	<0.005	mg/kg dw	11/03/1998	0.005	jap		74	SW 8260A
Dibromofluoromethane (Surr)	98.8	%	11/03/1998	81-129	jap		74	SW 8260A
Toluene-d8 (Surr)	85.0	%	11/03/1998	74-129	jap		74	SW 8260A
4-Bromofluoromethane (Surr)	85.4	%	11/03/1998	70-130	jap		74	SW 8260A
Prep, 8310 PNAs NON-AQUEOUS	extracted		11/06/1998		wna	770		SW 3540C
PNA CMPDS - 8310 NONAQUEOUS								
Acenaphthene	<0.021	mg/kg dw	11/09/1998	0.021	keh	770	1833	SW 8310
Acenaphthylene	<0.021	mg/kg dw	11/09/1998	0.021	keh	770	1833	SW 8310
Anthracene	<0.042	mg/kg dw	11/09/1998	0.042	keh	770	1833	SW 8310
Benzo(a)anthracene	0.043	mg/kg dw	11/09/1998	0.0027	keh	770	1833	SW 8310
Benzo(b)fluoranthene	0.038	mg/kg dw	11/09/1998	0.0038	keh	770	1833	SW 8310

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NATIONAL ENVIRONMENTAL TESTING, INC.

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ANALYTICAL REPORT

Mr. Wei-Lin Feng
ENSR
740 Pasquinelli Drive
Westmont, IL 60559

11/10/1998

Sample No. : 499912

NET Job No.: 98.13879

Sample Description: B21 (0-4)
ComEd-Waukegan; 1801-023-610

Date Taken: 10/26/1998
Time Taken: 10:15
IEPA Cert. No. 100221

Date Received: 10/27/1998
Time Received: 11:00
WDNR Cert. No. 999447130

Parameter	Results	Units	Date of Analysis	Method PQL	Analyst	Batch No. Prep/Run		Analytical Method
Benzo(k)fluoranthene	0.022	mg/kg dw	11/09/1998	0.0036	keh	770	1833	SW 8310
Benzo(a)pyrene	0.035	mg/kg dw	11/09/1998	0.0048	keh	770	1833	SW 8310
Benzo(ghi)perylene	<0.042	mg/kg dw	11/09/1998	0.042	keh	770	1833	SW 8310
Chrysene	0.034	mg/kg dw	11/09/1998	0.03	keh	770	1833	SW 8310
Dibenzo(a,h)anthracene	<0.006	mg/kg dw	11/09/1998	0.006	keh	770	1833	SW 8310
Fluoranthene	0.085	mg/kg dw	11/09/1998	0.021	keh	770	1833	SW 8310
Fluorene	<0.021	mg/kg dw	11/09/1998	0.021	keh	770	1833	SW 8310
Indeno(1,2,3-cd)pyrene	0.024	mg/kg dw	11/09/1998	0.0091	keh	770	1833	SW 8310
Naphthalene	<0.026	mg/kg dw	11/09/1998	0.026	keh	770	1833	SW 8310
Phenanthrene	0.051	mg/kg dw	11/09/1998	0.042	keh	770	1833	SW 8310
Pyrene	0.071	mg/kg dw	11/09/1998	0.021	keh	770	1833	SW 8310
Surr: p-Terphenyl	107.1	%	11/09/1998	43-125	keh	770	1833	SW 8310
PCB Non-Aqueous Extraction	COMPLETE		11/02/1998	COMPLETE	wna	380		SW 3540C
PCB'S NON-AQUEOUS								
PCB-1016	<0.042	mg/kg dw	11/05/1998	0.042	tls	380	52	SW 8082
PCB-1221	<0.042	mg/kg dw	11/05/1998	0.042	tls	380	52	SW 8082
PCB-1232	<0.042	mg/kg dw	11/05/1998	0.042	tls	380	52	SW 8082
PCB-1242	<0.042	mg/kg dw	11/05/1998	0.042	tls	380	52	SW 8082
PCB-1248	0.072	mg/kg dw	11/06/1998	0.042	tls	380	53	SW 8082
PCB-1254	<0.042	mg/kg dw	11/05/1998	0.042	tls	380	52	SW 8082
PCB-1260	<0.042	mg/kg dw	11/05/1998	0.042	tls	380	52	SW 8082
Decachlorobiphenyl (Surr)	96.0	%	11/05/1998	NA	tls	380	52	SW 8082
2,4,5,6-TCMX (Surr)	86.0	%	11/05/1998	NA	tls	380	52	SW 8082

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ANALYTICAL REPORT

Mr. Wei-Lin Feng
ENSR
740 Pasquinelli Drive
Westmont, IL 60559

11/10/1998

Sample No. : 499913

NET Job No.: 98.13879

Sample Description: B20 (0-4)
ComEd-Waukegan; 1801-023-610

Date Taken: 10/26/1998
Time Taken: 10:52
IEPA Cert. No. 100221

Date Received: 10/27/1998
Time Received: 11:00
WDNR Cert. No. 999447130

Parameter	Results		Units	Date of Analysis	Method PQL	Analyst	Batch No. Prep/Run		Analytical Method
pH, Non-Aqueous	8.03		units	10/30/1998	0.10	nwg		188	SW 9045B
Solids, Total	83.2		%	11/02/1998	0.1	efw		2515	SM 2540
Arsenic, GFAA	25		mg/kg dw	11/06/1998	0.60	mhp	235	672	SW 7060
Barium, ICP	192		mg/kg dw	11/06/1998	1.2	jtt	1165	2188	SW 6010B
Cadmium, ICP	3.1		mg/kg dw	11/06/1998	0.60	jtt	1165	2174	SW 6010B
Chromium, ICP	59		mg/kg dw	11/06/1998	2.4	jtt	1165	2159	SW 6010B
Lead, ICP	48		mg/kg dw	11/06/1998	4.8	jtt	1165	2397	SW 6010B
Mercury, CVAA	0.053		mg/kg dw	11/02/1998	0.048	sep	665	769	SW 7471A
Selenium, GFAA	0.70		mg/kg dw	11/07/1998	0.30	mhp	235	561	SW 7740
Silver, AA	<2.4		mg/kg dw	11/02/1998	2.4	sep	492	569	SW 7760
UST VOLATILES NON-AQUEOUS									
Benzene	<0.006		mg/kg dw	11/03/1998	0.006	jap		75	SW 8260A
Ethylbenzene	<0.006		mg/kg dw	11/03/1998	0.006	jap		75	SW 8260A
Toluene	<0.006		mg/kg dw	11/03/1998	0.006	jap		75	SW 8260A
Xylenes, Total	<0.006		mg/kg dw	11/03/1998	0.006	jap		75	SW 8260A
Dibromofluoromethane (Surr)	98.4		%	11/03/1998	81-129	jap		75	SW 8260A
Toluene-d8 (Surr)	106.8		%	11/03/1998	74-129	jap		75	SW 8260A
4-Bromofluoromethane (Surr)	109.2		%	11/03/1998	70-130	jap		75	SW 8260A
Prep, 8310 PNAs NON-AQUEOUS	extracted			10/30/1998		btl	767		SW 3540C
PNA CMPDS - 8310 NONAQUEOUS									
Acenaphthene	<0.024		mg/kg dw	11/06/1998	0.024	keh	767	1830	SW 8310
Acenaphthylene	<0.024		mg/kg dw	11/06/1998	0.024	keh	767	1830	SW 8310
Anthracene	<0.048		mg/kg dw	11/06/1998	0.048	keh	767	1830	SW 8310
Benzo(a)anthracene	<0.66	MX	mg/kg dw	11/06/1998	0.0031	keh	767	1830	SW 8310
Benzo(b)fluoranthene	<0.017	MX	mg/kg dw	11/06/1998	0.0043	keh	767	1830	SW 8310

MX : Dilution required due to sample matrix; analyte is not detected.

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ANALYTICAL REPORT

Mr. Wei-Lin Feng
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740 Pasquinelli Drive
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11/10/1998

Sample No. : 499913

NET Job No.: 98.13879

Sample Description: B20 (0-4)
ComEd-Waukegan; 1801-023-610

Date Taken: 10/26/1998
Time Taken: 10:52
IEPA Cert. No. 100221

Date Received: 10/27/1998
Time Received: 11:00
WDNR Cert. No. 999447130

Parameter	Results		Units	Date of Analysis	Method PQL	Analyst	Batch No. Prep/Run		Analytical Method
Benzo(k)fluoranthene	<0.064	MX	mg/kg dw	11/06/1998	0.0041	keh	767	1830	SW 8310
Benzo(a)pyrene	<0.038	MX	mg/kg dw	11/06/1998	0.0055	keh	767	1830	SW 8310
Benzo(ghi)perylene	<0.048		mg/kg dw	11/06/1998	0.048	keh	767	1830	SW 8310
Chrysene	0.078		mg/kg dw	11/06/1998	0.04	keh	767	1830	SW 8310
Dibenzo(a,h)anthracene	<0.023	MX	mg/kg dw	11/06/1998	0.007	keh	767	1830	SW 8310
Fluoranthene	<0.12	MX	mg/kg dw	11/06/1998	0.024	keh	767	1830	SW 8310
Fluorene	<0.024		mg/kg dw	11/06/1998	0.024	keh	767	1830	SW 8310
Indeno(1,2,3-cd)pyrene	<0.010		mg/kg dw	11/06/1998	0.010	keh	767	1830	SW 8310
Naphthalene	0.038		mg/kg dw	11/06/1998	0.030	keh	767	1830	SW 8310
Phenanthrene	0.097		mg/kg dw	11/06/1998	0.048	keh	767	1830	SW 8310
Pyrene	0.070		mg/kg dw	11/06/1998	0.024	keh	767	1830	SW 8310
Surr: p-Terphenyl	Masked			11/06/1998	43-125	keh	767	1830	SW 8310
PCB Non-Aqueous Extraction	COMPLETE			11/02/1998	COMPLETE	wna	380		SW 3540C
PCB'S NON-AQUEOUS									
PCB-1016	<0.048		mg/kg dw	11/04/1998	0.048	tls	380	57	SW 8082
PCB-1221	<0.048		mg/kg dw	11/04/1998	0.048	tls	380	57	SW 8082
PCB-1232	<0.048		mg/kg dw	11/04/1998	0.048	tls	380	57	SW 8082
PCB-1242	<0.048		mg/kg dw	11/04/1998	0.048	tls	380	57	SW 8082
PCB-1248	<0.048		mg/kg dw	11/04/1998	0.048	tls	380	57	SW 8082
PCB-1254	<0.048		mg/kg dw	11/04/1998	0.048	tls	380	57	SW 8082
PCB-1260	<0.048		mg/kg dw	11/04/1998	0.048	tls	380	57	SW 8082
Decachlorobipheny: Surr	70.0		%	11/04/1998	NA	tls	380	57	SW 8082
2,4,5,6-TCMX (Surr	75.0		%	11/04/1998	NA	tls	380	57	SW 8082

MX : Dilution required due to sample matrix; analyte is not detected.

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ANALYTICAL REPORT

Mr. Wei-Lin Feng
ENSR
740 Pasquinelli Drive
Westmont, IL 60559

11/10/1998

Sample No. : 499914

NET Job No.: 98.13879

Sample Description: B19 (0-4)
ComEd-Waukegan; 1801-023-610

Date Taken: 10/26/1998
Time Taken: 11:12
IEPA Cert. No. 100221

Date Received: 10/27/1998
Time Received: 11:00
WDNR Cert. No. 999447130

Parameter	Results	Units	Date of Analysis	Method PQL	Analyst	Batch No. Prep/Run		Analytical Method
pH, Non-Aqueous	7.95	units	10/30/1998	0.10	nwg		188	SW 9045B
Solids, Total	92.5	%	11/02/1998	0.1	efw		2515	SM 2540
Arsenic, GFAA	6.8	mg/kg dw	11/06/1998	0.54	mhp	235	672	SW 7060
Barium, ICP	238	mg/kg dw	11/06/1998	1.1	jtt	1165	2188	SW 6010B
Cadmium, ICP	0.93	mg/kg dw	11/06/1998	0.54	jtt	1165	2174	SW 6010B
Chromium, ICP	50	mg/kg dw	11/06/1998	2.2	jtt	1165	2159	SW 6010B
Lead, ICP	43	mg/kg dw	11/06/1998	4.3	jtt	1165	2397	SW 6010B
Mercury, CVAA	0.22	mg/kg dw	11/02/1998	0.043	sep	665	769	SW 7471A
Selenium, GFAA	<0.27	mg/kg dw	11/07/1998	0.27	mhp	235	561	SW 7740
Silver, AA	<2.2	mg/kg dw	11/02/1998	2.2	sep	492	569	SW 7760
UST VOLATILES NON-AQUEOUS								
Benzene	<0.005	mg/kg dw	11/02/1998	0.005	jap		73	SW 8260A
Ethylbenzene	<0.005	mg/kg dw	11/02/1998	0.005	jap		73	SW 8260A
Toluene	<0.005	mg/kg dw	11/02/1998	0.005	jap		73	SW 8260A
Xylenes, Total	<0.005	mg/kg dw	11/02/1998	0.005	jap		73	SW 8260A
Dibromofluoromethane (Surr)	95.8	%	11/02/1998	81-129	jap		73	SW 8260A
Toluene-d8 (Surr)	95.6	%	11/02/1998	74-129	jap		73	SW 8260A
4-Bromofluoromethane (Surr)	98.8	%	11/02/1998	70-130	jap		73	SW 8260A
Prep, 8310 PNAs NON-AQUEOUS	extracted		10/30/1998		btl	767		SW 3540C
PNA CMPDS - 8310 NONAQUEOUS								
Acenaphthene	<0.022	mg/kg dw	11/06/1998	0.022	keh	767	1830	SW 8310
Acenaphthylene	<0.022	mg/kg dw	11/06/1998	0.022	keh	767	1830	SW 8310
Anthracene	<0.043	mg/kg dw	11/06/1998	0.043	keh	767	1830	SW 8310
Benzo(a)anthracene	0.067	mg/kg dw	11/06/1998	0.0028	keh	767	1830	SW 8310
Benzo(b)fluoranthene	0.030	mg/kg dw	11/06/1998	0.0039	keh	767	1830	SW 8310

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ANALYTICAL REPORT

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11/10/1998

Sample No. : 499914

NET Job No.: 98.13879

Sample Description: B19 (0-4)
ComEd-Waukegan; 1801-023-610

Date Taken: 10/26/1998
Time Taken: 11:12
IEPA Cert. No. 100221

Date Received: 10/27/1998
Time Received: 11:00
WDNR Cert. No. 999447130

Parameter	Results		Units	Date of Analysis	Method PQL	Analyst	Batch No. Prep/Run		Analytical Method
Benzo(k)fluoranthene	<0.024	MX	mg/kg dw	11/06/1998	0.0037	keh	767	1830	SW 8310
Benzo(a)pyrene	0.035		mg/kg dw	11/06/1998	0.0050	keh	767	1830	SW 8310
Benzo(ghi)perylene	<0.043		mg/kg dw	11/06/1998	0.043	keh	767	1830	SW 8310
Chrysene	0.056		mg/kg dw	11/06/1998	0.03	keh	767	1830	SW 8310
Dibenzo(a,h)anthracene	<0.0080	MX	mg/kg dw	11/06/1998	0.006	keh	767	1830	SW 8310
Fluoranthene	0.13		mg/kg dw	11/06/1998	0.022	keh	767	1830	SW 8310
Fluorene	<0.022		mg/kg dw	11/06/1998	0.022	keh	767	1830	SW 8310
Indeno(1,2,3-cd)pyrene	0.022		mg/kg dw	11/06/1998	0.0093	keh	767	1830	SW 8310
Naphthalene	0.082		mg/kg dw	11/06/1998	0.027	keh	767	1830	SW 8310
Phenanthrene	0.14		mg/kg dw	11/06/1998	0.043	keh	767	1830	SW 8310
Pyrene	0.078		mg/kg dw	11/06/1998	0.022	keh	767	1830	SW 8310
Surr: p-Terphenyl	Masked			11/06/1998	43-125	keh	767	1830	SW 8310
PCB Non-Aqueous Extraction	COMPLETE			11/02/1998	COMPLETE	wna	380		SW 3540C
PCB'S NON-AQUEOUS									
PCB-1016	<0.043		mg/kg dw	11/05/1998	0.043	tls	380	57	SW 8082
PCB-1221	<0.043		mg/kg dw	11/05/1998	0.043	tls	380	57	SW 8082
PCB-1232	<0.043		mg/kg dw	11/05/1998	0.043	tls	380	57	SW 8082
PCB-1242	<0.043		mg/kg dw	11/05/1998	0.043	tls	380	57	SW 8082
PCB-1248	<0.043		mg/kg dw	11/05/1998	0.043	tls	380	57	SW 8082
PCB-1254	<0.043		mg/kg dw	11/05/1998	0.043	tls	380	57	SW 8082
PCB-1260	<0.043		mg/kg dw	11/05/1998	0.043	tls	380	57	SW 8082
Decachlorobiphenyl (Surr)	75.0		%	11/05/1998	NA	tls	380	57	SW 8082
2,4,5,6-TCMX (Surr)	85.0		%	11/05/1998	NA	tls	380	57	SW 8082

MX : Dilution required due to sample matrix; analyte is not detected.

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ANALYTICAL REPORT

Mr. Wei-Lin Feng
ENSR
740 Pasquinelli Drive
Westmont, IL 60559

11/10/1998

Sample No. : 499915

NET Job No.: 98.13879

Sample Description: B4 (0-4)
ComEd-Waukegan; 1801-023-610

Date Taken: 10/26/1998
Time Taken: 11:20
IEPA Cert. No. 100221

Date Received: 10/27/1998
Time Received: 11:00
WDNR Cert. No. 999447130

Parameter	Results		Units	Date of Analysis	Method PQL	Analyst	Batch No. Prep/Run		Analytical Method
pH, Non-Aqueous	7.50		units	10/30/1998	0.10	nwg		189	SW 9045B
Solids, Total	83.8		%	11/02/1998	0.1	efw		2515	SM 2540
Arsenic, GFAA	4.4		mg/kg dw	11/06/1998	0.60	mhp	235	672	SW 7060
Barium, ICP	16		mg/kg dw	11/06/1998	1.2	jtt	1165	2188	SW 6010B
Cadmium, ICP	<0.60		mg/kg dw	11/06/1998	0.60	jtt	1165	2174	SW 6010B
Chromium, ICP	31		mg/kg dw	11/06/1998	2.4	jtt	1165	2159	SW 6010B
Lead, ICP	13		mg/kg dw	11/06/1998	4.8	jtt	1165	2397	SW 6010B
Mercury, CVAA	<0.048		mg/kg dw	11/02/1998	0.048	sep	665	769	SW 7471A
Selenium, GFAA	<0.30		mg/kg dw	11/07/1998	0.30	mhp	235	561	SW 7740
Silver, AA	<2.4		mg/kg dw	11/02/1998	2.4	sep	492	569	SW 7760
UST VOLATILES NON-AQUEOUS									
Benzene	<0.006		mg/kg dw	11/03/1998	0.006	jap		75	SW 8260A
Ethylbenzene	<0.006		mg/kg dw	11/03/1998	0.006	jap		75	SW 8260A
Toluene	<0.006		mg/kg dw	11/03/1998	0.006	jap		75	SW 8260A
Xylenes, Total	<0.006		mg/kg dw	11/03/1998	0.006	jap		75	SW 8260A
Dibromofluoromethane (Surr)	98.4		%	11/03/1998	81-129	jap		75	SW 8260A
Toluene-d8 (Surr)	101.6		%	11/03/1998	74-129	jap		75	SW 8260A
4-Bromofluoromethane (Surr)	105.2		%	11/03/1998	70-130	jap		75	SW 8260A
Prep, 8310 PNAs NON-AQUEOUS	extracted			11/03/1998		mmv	767		SW 3540C
PNA CMPDS - 8310 NONAQUEOUS									
Acenaphthene	<0.024		mg/kg dw	11/05/1998	0.024	keh	767	1830	SW 8310
Acenaphthylene	<0.024		mg/kg dw	11/05/1998	0.024	keh	767	1830	SW 8310
Anthracene	<0.12	MX	mg/kg dw	11/05/1998	0.048	keh	767	1830	SW 8310
Benzo(a)anthracene	0.041		mg/kg dw	11/05/1998	0.0031	keh	767	1830	SW 8310
Benzo(b)fluoranthene	0.012		mg/kg dw	11/05/1998	0.0043	keh	767	1830	SW 8310

MX : Dilution required due to sample matrix; analyte is not detected.

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ANALYTICAL REPORT

Mr. Wei-Lin Feng
ENSR
740 Pasquinelli Drive
Westmont, IL 60559

11/10/1998

Sample No. : 499915

NET Job No.: 98.13879

Sample Description: B4 (0-4)
ComEd-Waukegan; 1801-023-610

Date Taken: 10/26/1998
Time Taken: 11:20
IEPA Cert. No. 100221

Date Received: 10/27/1998
Time Received: 11:00
WDNR Cert. No. 999447130

Parameter	Results		Units	Date of Analysis	Method PQL	Analyst	Batch No. Prep/Run		Analytical Method
Benzo(k)fluoranthene	<0.0041		mg/kg dw	11/05/1998	0.0041	keh	767	1830	SW 8310
Benzo(a)pyrene	0.0092		mg/kg dw	11/05/1998	0.0055	keh	767	1830	SW 8310
Benzo(ghi)perylene	<0.048		mg/kg dw	11/05/1998	0.048	keh	767	1830	SW 8310
Chrysene	<0.04		mg/kg dw	11/05/1998	0.04	keh	767	1830	SW 8310
Dibenzo(a,h)anthracene	<0.007		mg/kg dw	11/05/1998	0.007	keh	767	1830	SW 8310
Fluoranthene	<0.074	MX	mg/kg dw	11/05/1998	0.024	keh	767	1830	SW 8310
Fluorene	<0.045	MX	mg/kg dw	11/05/1998	0.024	keh	767	1830	SW 8310
Indeno(1,2,3-cd)pyrene	<0.010		mg/kg dw	11/05/1998	0.010	keh	767	1830	SW 8310
Naphthalene	0.26		mg/kg dw	11/05/1998	0.030	keh	767	1830	SW 8310
Phenanthrene	0.16		mg/kg dw	11/05/1998	0.048	keh	767	1830	SW 8310
Pyrene	<0.042	MX	mg/kg dw	11/05/1998	0.024	keh	767	1830	SW 8310
Surr: p-Terphenyl	Masked			11/05/1998	43-125	keh	767	1830	SW 8310
PCB Non-Aqueous Extraction	COMPLETE			11/02/1998	COMPLETE	wna	380		SW 3540C
PCB'S NON-AQUEOUS									
PCB-1016	<0.048		mg/kg dw	11/05/1998	0.048	tls	380	57	SW 8082
PCB-1221	<0.048		mg/kg dw	11/05/1998	0.048	tls	380	57	SW 8082
PCB-1232	<0.048		mg/kg dw	11/05/1998	0.048	tls	380	57	SW 8082
PCB-1242	<0.048		mg/kg dw	11/05/1998	0.048	tls	380	57	SW 8082
PCB-1248	<0.048		mg/kg dw	11/05/1998	0.048	tls	380	57	SW 8082
PCB-1254	<0.048		mg/kg dw	11/05/1998	0.048	tls	380	57	SW 8082
PCB-1260	<0.048		mg/kg dw	11/05/1998	0.048	tls	380	57	SW 8082
Decachlorobiphenyl (Surr)	78.0		%	11/05/1998	NA	tls	380	57	SW 8082
2,4,5,6-TCMX (Surr	80.0		%	11/05/1998	NA	tls	380	57	SW 8082

MX : Dilution required due to sample matrix; analyte is not detected.

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ANALYTICAL REPORT

Mr. Wei-Lin Feng
ENSR
740 Pasquinelli Drive
Westmont, IL 60559

11/10/1998

Sample No. : 499916

NET Job No.: 98.13879

Sample Description: B2 (0-4)
ComEd-Waukegan; 1801-023-610

Date Taken: 10/26/1998
Time Taken: 13:15
IEPA Cert. No. 100221

Date Received: 10/27/1998
Time Received: 11:00
WDNR Cert. No. 999447130

Parameter	Results		Units	Date of Analysis	Method PQL	Analyst	Batch No. Prep/Run		Analytical Method
pH, Non-Aqueous	8.80		units	10/30/1998	0.10	nwg		188	SW 9045B
Solids, Total	92.4		%	11/02/1998	0.1	efw		2515	SM 2540
Arsenic, GFAA	3.6		mg/kg dw	11/06/1998	0.54	mhp	235	672	SW 7060
Barium, ICP	22		mg/kg dw	11/06/1998	1.1	jtt	1165	2188	SW 6010B
Cadmium, ICP	<0.54		mg/kg dw	11/06/1998	0.54	jtt	1165	2174	SW 6010B
Chromium, ICP	8.3		mg/kg dw	11/06/1998	2.2	jtt	1165	2159	SW 6010B
Lead, ICP	14		mg/kg dw	11/06/1998	4.3	jtt	1165	2397	SW 6010B
Mercury, CVAA	0.083		mg/kg dw	11/02/1998	0.043	sep	665	769	SW 7471A
Selenium, GFAA	<0.27		mg/kg dw	11/07/1998	0.27	mhp	235	561	SW 7740
Silver, AA	<2.2		mg/kg dw	11/02/1998	2.2	sep	492	569	SW 7760
UST VOLATILES NON-AQUEOUS									
Benzene	<0.005		mg/kg dw	11/03/1998	0.005	jap		75	SW 8260A
Ethylbenzene	<0.005		mg/kg dw	11/03/1998	0.005	jap		75	SW 8260A
Toluene	<0.005		mg/kg dw	11/03/1998	0.005	jap		75	SW 8260A
Xylenes, Total	<0.005		mg/kg dw	11/03/1998	0.005	jap		75	SW 8260A
Dibromofluoromethane (Surr)	93.8		%	11/03/1998	81-129	jap		75	SW 8260A
Toluene-d8 (Surr)	96.8		%	11/03/1998	74-129	jap		75	SW 8260A
4-Bromofluoromethane (Surr)	101.4		%	11/03/1998	70-130	jap		75	SW 8260A
Prep, 8310 PNAs NON-AQUEOUS	extracted			11/03/1998		mmv	767		SW 3540C
PNA CMPDS - 8310 NONAQUEOUS									
Acenaphthene	<0.022		mg/kg dw	11/05/1998	0.022	keh	767	1830	SW 8310
Acenaphthylene	<0.022		mg/kg dw	11/05/1998	0.022	keh	767	1830	SW 8310
Anthracene	<0.18	MX	mg/kg dw	11/05/1998	0.043	keh	767	1830	SW 8310
Benzo(a)anthracene	0.31		mg/kg dw	11/05/1998	0.0028	keh	767	1830	SW 8310
Benzo(b)fluoranthene	0.062		mg/kg dw	11/05/1998	0.0039	keh	767	1830	SW 8310

MX : Dilution required due to sample matrix; analyte is not detected.

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ANALYTICAL REPORT

Mr. Wei-Lin Feng
ENSR
740 Pasquinelli Drive
Westmont, IL 60559

11/10/1998

Sample No. : 499916

NET Job No.: 98.13879

Sample Description: B2 (0-4)
ComEd-Waukegan; 1801-023-610

Date Taken: 10/26/1998
Time Taken: 13:15
IEPA Cert. No. 100221

Date Received: 10/27/1998
Time Received: 11:00
WDNR Cert. No. 999447130

Parameter	Results		Units	Date of Analysis	Method PQL	Analyst	Batch No. Prep/Run		Analytical Method
Benzo(k)fluoranthene	<0.13	MX	mg/kg dw	11/05/1998	0.0037	keh	767	1830	SW 8310
Benzo(a)pyrene	0.11		mg/kg dw	11/05/1998	0.0050	keh	767	1830	SW 8310
Benzo(ghi)perylene	0.10		mg/kg dw	11/05/1998	0.043	keh	767	1830	SW 8310
Chrysene	0.34		mg/kg dw	11/05/1998	0.03	keh	767	1830	SW 8310
Dibenzo(a,h)anthracene	0.038		mg/kg dw	11/05/1998	0.006	keh	767	1830	SW 8310
Fluoranthene	<0.70	MX	mg/kg dw	11/05/1998	0.022	keh	767	1830	SW 8310
Fluorene	<0.077	MX	mg/kg dw	11/05/1998	0.022	keh	767	1830	SW 8310
Indeno(1,2,3-cd)pyrene	0.047		mg/kg dw	11/05/1998	0.0093	keh	767	1830	SW 8310
Naphthalene	0.34		mg/kg dw	11/05/1998	0.027	keh	767	1830	SW 8310
Phenanthrene	0.92		mg/kg dw	11/05/1998	0.043	keh	767	1830	SW 8310
Pyrene	0.48		mg/kg dw	11/05/1998	0.022	keh	767	1830	SW 8310
Surr: p-Terphenyl	Masked			11/05/1998	43-125	keh	767	1830	SW 8310
PCB Non-Aqueous Extraction	COMPLETE			11/02/1998	COMPLETE	wna	380		SW 3540C
PCB'S NON-AQUEOUS									
PCB-1016	<0.043		mg/kg dw	11/05/1998	0.043	tls	380	57	SW 8082
PCB-1221	<0.043		mg/kg dw	11/05/1998	0.043	tls	380	57	SW 8082
PCB-1232	<0.043		mg/kg dw	11/05/1998	0.043	tls	380	57	SW 8082
PCB-1242	<0.043		mg/kg dw	11/05/1998	0.043	tls	380	57	SW 8082
PCB-1248	<0.043		mg/kg dw	11/05/1998	0.043	tls	380	57	SW 8082
PCB-1254	<0.043		mg/kg dw	11/05/1998	0.043	tls	380	57	SW 8082
PCB-1260	<0.043		mg/kg dw	11/05/1998	0.043	tls	380	57	SW 8082
Decachlorobiphenyl (Surr)	75.0		%	11/05/1998	NA	tls	380	57	SW 8082
2,4,5,6-TCMX (Surr)	88.0		%	11/05/1998	NA	tls	380	57	SW 8082

MX : Dilution required due to sample matrix; analyte is not detected.

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ANALYTICAL REPORT

Mr. Wei-Lin Feng
ENSR
740 Pasquinelli Drive
Westmont, IL 60559

11/10/1998

Sample No. : 499917

NET Job No.: 98.13879

Sample Description: B13 (0-4)
ComEd-Waukegan; 1801-023-610

Date Taken: 10/26/1998
Time Taken: 13:40
IEPA Cert. No. 100221

Date Received: 10/27/1998
Time Received: 11:00
WDNR Cert. No. 999447130

Parameter	Results	Units	Date of Analysis	Method PQL	Analyst	Batch No. Prep/Run		Analytical Method
pH, Non-Aqueous	7.10	units	10/30/1998	0.10	nwg		189	SW 9045B
Solids, Total	77.4	%	11/02/1998	0.1	efw		2515	SM 2540
Arsenic, GFAA	5.7	mg/kg dw	11/06/1998	0.65	mhp	235	672	SW 7060
Barium, ICP	76	mg/kg dw	11/06/1998	1.3	jtt	1165	2188	SW 6010B
Cadmium, ICP	1.3	mg/kg dw	11/06/1998	0.65	jtt	1165	2174	SW 6010B
Chromium, ICP	18	mg/kg dw	11/06/1998	2.6	jtt	1165	2159	SW 6010B
Lead, ICP	52	mg/kg dw	11/06/1998	5.2	jtt	1165	2397	SW 6010B
Mercury, CVAA	0.11	mg/kg dw	11/02/1998	0.052	sep	665	769	SW 7471A
Selenium, GFAA	<0.32	mg/kg dw	11/07/1998	0.32	mhp	235	561	SW 7740
Silver, AA	<2.6	mg/kg dw	11/03/1998	2.6	sep	493	570	SW 7760
UST VOLATILES NON-AQUEOUS								
Benzene	<0.006	mg/kg dw	11/03/1998	0.006	jap		75	SW 8260A
Ethylbenzene	<0.006	mg/kg dw	11/03/1998	0.006	jap		75	SW 8260A
Toluene	<0.006	mg/kg dw	11/03/1998	0.006	jap		75	SW 8260A
Xylenes, Total	<0.006	mg/kg dw	11/03/1998	0.006	jap		75	SW 8260A
Dibromofluoromethane (Surr)	90.8	%	11/03/1998	81-129	jap		75	SW 8260A
Toluene-d8 (Surr)	90.6	%	11/03/1998	74-129	jap		75	SW 8260A
4-Bromofluoromethane (Surr)	92.2	%	11/03/1998	70-130	jap		75	SW 8260A
Prep, 8310 PNAs NON-AQUEOUS	extracted		11/03/1998		mmv	767		SW 3540C
PNA CMPDS - 8310 NONAQUEOUS	ELV							
Acenaphthene	<0.1	mg/kg dw	11/05/1998	0.026	keh	767	1830	SW 8310
Acenaphthylene	<0.1	mg/kg dw	11/05/1998	0.026	keh	767	1830	SW 8310
Anthracene	<0.3	mg/kg dw	11/05/1998	0.052	keh	767	1830	SW 8310
Benzo(a)anthracene	0.18	mg/kg dw	11/05/1998	0.0034	keh	767	1830	SW 8310
Benzo(b)fluoranthene	0.068	mg/kg dw	11/05/1998	0.0047	keh	767	1830	SW 8310

ELV : Elevated reporting limits due to matrix interference.

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ANALYTICAL REPORT

Mr. Wei-Lin Feng
ENSR
740 Pasquinelli Drive
Westmont, IL 60559

11/10/1998

Sample No. : 499917

NET Job No.: 98.13879

Sample Description: B13 (0-4)
ComEd-Waukegan; 1801-023-610

Date Taken: 10/26/1998
Time Taken: 13:40
IEPA Cert. No. 100221

Date Received: 10/27/1998
Time Received: 11:00
WDNR Cert. No. 999447130

Parameter	Results	Units	Date of Analysis	Method PQL	Analyst	Batch No. Prep/Run		Analytical Method
Benzo(k)fluoranthene	<0.032	mg/kg dw	11/05/1998	0.0044	keh	767	1830	SW 8310
Benzo(a)pyrene	0.14	mg/kg dw	11/05/1998	0.0059	keh	767	1830	SW 8310
Benzo(ghi)perylene	<0.3	mg/kg dw	11/05/1998	0.052	keh	767	1830	SW 8310
Chrysene	<0.2	mg/kg dw	11/05/1998	0.04	keh	767	1830	SW 8310
Dibenzo(a,h)anthracene	<0.04	mg/kg dw	11/05/1998	0.008	keh	767	1830	SW 8310
Fluoranthene	<0.56	mg/kg dw	11/05/1998	0.026	keh	767	1830	SW 8310
Fluorene	<0.1	mg/kg dw	11/05/1998	0.026	keh	767	1830	SW 8310
Indeno(1,2,3-cd)pyrene	<0.06	mg/kg dw	11/05/1998	0.011	keh	767	1830	SW 8310
Naphthalene	<0.2	mg/kg dw	11/05/1998	0.032	keh	767	1830	SW 8310
Phenanthrene	0.67	mg/kg dw	11/05/1998	0.052	keh	767	1830	SW 8310
Pyrene	<0.45	mg/kg dw	11/05/1998	0.026	keh	767	1830	SW 8310
Surr: p-Terphenyl	Masked		11/05/1998	43-125	keh	767	1830	SW 8310
PCB Non-Aqueous Extraction	COMPLETE		11/02/1998	COMPLETE	wna	380		SW 3540C
PCB'S NON-AQUEOUS								
PCB-1016	<0.052	mg/kg dw	11/05/1998	0.052	tls	380	57	SW 8082
PCB-1221	<0.052	mg/kg dw	11/05/1998	0.052	tls	380	57	SW 8082
PCB-1232	<0.052	mg/kg dw	11/05/1998	0.052	tls	380	57	SW 8082
PCB-1242	<0.052	mg/kg dw	11/05/1998	0.052	tls	380	57	SW 8082
PCB-1248	<0.052	mg/kg dw	11/05/1998	0.052	tls	380	57	SW 8082
PCB-1254	<0.052	mg/kg dw	11/05/1998	0.052	tls	380	57	SW 8082
PCB-1260	<0.052	mg/kg dw	11/05/1998	0.052	tls	380	57	SW 8082
Decachlorobiphenyl (Surr)	71.0	%	11/05/1998	NA	tls	380	57	SW 8082
2,4,5,6-TCMX (Surr	77.0	%	11/05/1998	NA	tls	380	57	SW 8082

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ANALYTICAL REPORT

Mr. Wei-Lin Feng
ENSR
740 Pasquinelli Drive
Westmont, IL 60559

11/10/1998

Sample No. : 499918

NET Job No.: 98.13879

Sample Description: B14 (0-4)
ComEd-Waukegan; 1801-023-610

Date Taken: 10/26/1998
Time Taken: 14:25
IEPA Cert. No. 100221

Date Received: 10/27/1998
Time Received: 11:00
WDNR Cert. No. 999447130

Parameter	Results		Units	Date of Analysis	Method PQL	Analyst	Batch No. Prep/Run		Analytical Method
pH, Non-Aqueous	9.04		units	10/30/1998	0.10	nwg		189	SW 9045B
Solids, Total	90.2		%	11/02/1998	0.1	efw		2515	SM 2540
Arsenic, GFAA	7.5		mg/kg dw	11/06/1998	0.55	mhp	235	672	SW 7060
Barium, ICP	322		mg/kg dw	11/06/1998	1.1	jtt	1165	2188	SW 6010B
Cadmium, ICP	0.70		mg/kg dw	11/06/1998	0.55	jtt	1165	2174	SW 6010B
Chromium, ICP	233		mg/kg dw	11/06/1998	2.2	jtt	1165	2159	SW 6010B
Lead, ICP	35		mg/kg dw	11/06/1998	4.4	jtt	1165	2397	SW 6010B
Mercury, CVAA	0.058		mg/kg dw	11/02/1998	0.044	sep	665	769	SW 7471A
Selenium, GFAA	<0.28		mg/kg dw	11/07/1998	0.28	mhp	235	561	SW 7740
Silver, AA	<2.2		mg/kg dw	11/03/1998	2.2	sep	493	570	SW 7760
UST VOLATILES NON-AQUEOUS									
Benzene	<0.006		mg/kg dw	11/03/1998	0.006	jap		75	SW 8260A
Ethylbenzene	<0.006		mg/kg dw	11/03/1998	0.006	jap		75	SW 8260A
Toluene	<0.006		mg/kg dw	11/03/1998	0.006	jap		75	SW 8260A
Xylenes, Total	<0.006		mg/kg dw	11/03/1998	0.006	jap		75	SW 8260A
Dibromofluoromethane (Surr)	91.2		%	11/03/1998	81-129	jap		75	SW 8260A
Toluene-d8 (Surr)	92.6		%	11/03/1998	74-129	jap		75	SW 8260A
4-Bromofluoromethane (Surr)	98.6		%	11/03/1998	70-130	jap		75	SW 8260A
Prep, 8310 PNAs NON-AQUEOUS	extracted			11/03/1998		mmv	767		SW 3540C
PNA CMPDS - 8310 NONAQUEOUS									
Acenaphthene	<0.022		mg/kg dw	11/05/1998	0.022	keh	767	1830	SW 8310
Acenaphthylene	<0.022		mg/kg dw	11/05/1998	0.022	keh	767	1830	SW 8310
Anthracene	<0.044		mg/kg dw	11/05/1998	0.044	keh	767	1830	SW 8310
Benzo(a)anthracene	<0.031	MX	mg/kg dw	11/05/1998	0.0029	keh	767	1830	SW 8310
Benzo(b)fluoranthene	0.0096		mg/kg dw	11/05/1998	0.0040	keh	767	1830	SW 8310

MX : Dilution required due to sample matrix; analyte is not detected.

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ANALYTICAL REPORT

Mr. Wei-Lin Feng
ENSR
740 Pasquinelli Drive
Westmont, IL 60559

11/10/1998

Sample No. : 499918

NET Job No.: 98.13879

Sample Description: B14 (0-4)
ComEd-Waukegan; 1801-023-610

Date Taken: 10/26/1998
Time Taken: 14:25
IEPA Cert. No. 100221

Date Received: 10/27/1998
Time Received: 11:00
WDNR Cert. No. 999447130

Parameter	Results		Units	Date of Analysis	Method PQL	Analyst	Batch No. Prep/Run		Analytical Method
Benzo(k)fluoranthene	<0.0082	MX	mg/kg dw	11/05/1998	0.0038	keh	767	1830	SW 8310
Benzo(a)pyrene	<0.0096	MX	mg/kg dw	11/05/1998	0.0051	keh	767	1830	SW 8310
Benzo(ghi)perylene	<0.044		mg/kg dw	11/05/1998	0.044	keh	767	1830	SW 8310
Chrysene	<0.03		mg/kg dw	11/05/1998	0.03	keh	767	1830	SW 8310
Dibenzo(a,h)anthracene	<0.007		mg/kg dw	11/05/1998	0.007	keh	767	1830	SW 8310
Fluoranthene	<0.022		mg/kg dw	11/05/1998	0.022	keh	767	1830	SW 8310
Fluorene	<0.022		mg/kg dw	11/05/1998	0.022	keh	767	1830	SW 8310
Indeno(1,2,3-cd)pyrene	<0.0095		mg/kg dw	11/05/1998	0.0095	keh	767	1830	SW 8310
Naphthalene	<0.028		mg/kg dw	11/05/1998	0.028	keh	767	1830	SW 8310
Phenanthrene	<0.044		mg/kg dw	11/05/1998	0.044	keh	767	1830	SW 8310
Pyrene	<0.022		mg/kg dw	11/05/1998	0.022	keh	767	1830	SW 8310
Surr: p-Terphenyl	68.0		%	11/05/1998	43-125	keh	767	1830	SW 8310
PCB Non-Aqueous Extraction	COMPLETE			11/02/1998	COMPLETE	wna	380		SW 3540C
PCB'S NON-AQUEOUS									
PCB-1016	<0.044		mg/kg dw	11/05/1998	0.044	tls	380	57	SW 8082
PCB-1221	<0.044		mg/kg dw	11/05/1998	0.044	tls	380	57	SW 8082
PCB-1232	<0.044		mg/kg dw	11/05/1998	0.044	tls	380	57	SW 8082
PCB-1242	<0.044		mg/kg dw	11/05/1998	0.044	tls	380	57	SW 8082
PCB-1248	<0.044		mg/kg dw	11/05/1998	0.044	tls	380	57	SW 8082
PCB-1254	<0.044		mg/kg dw	11/05/1998	0.044	tls	380	57	SW 8082
PCB-1260	<0.044		mg/kg dw	11/05/1998	0.044	tls	380	57	SW 8082
Decachlorobiphenyl (Surr)	85.0		%	11/05/1998	NA	tls	380	57	SW 8082
2,4,5,6-TCMX (Surr)	88.0		%	11/05/1998	NA	tls	380	57	SW 8082

MX : Dilution required due to sample matrix; analyte is not detected.

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ANALYTICAL REPORT

Mr. Wei-Lin Feng
ENSR
740 Pasquinelli Drive
Westmont, IL 60559

11/10/1998

Sample No. : 499919

NET Job No.: 98.13879

Sample Description: B16 (0-4)
ComEd-Waukegan; 1801-023-610

Date Taken: 10/26/1998
Time Taken: 14:35
IEPA Cert. No. 100221

Date Received: 10/27/1998
Time Received: 11:00
WDNR Cert. No. 999447130

Parameter	Results	Units	Date of Analysis	Method PQL	Analyst	Batch No. Prep/Run		Analytical Method
pH, Non-Aqueous	7.97	units	10/30/1998	0.10	nwg		189	SW 9045B
Solids, Total	79.8	%	11/02/1998	0.1	efw		2515	SM 2540
Arsenic, GFAA	3.3	mg/kg dw	11/06/1998	0.63	mhp	235	672	SW 7060
Barium, ICP	401	mg/kg dw	11/06/1998	1.3	jtt	1165	2188	SW 6010B
Cadmium, ICP	<0.63	mg/kg dw	11/06/1998	0.63	jtt	1165	2174	SW 6010B
Chromium, ICP	14	mg/kg dw	11/06/1998	2.5	jtt	1165	2159	SW 6010B
Lead, ICP	23	mg/kg dw	11/06/1998	5.0	jtt	1165	2397	SW 6010B
Mercury, CVAA	0.60	mg/kg dw	11/02/1998	0.050	sep	665	769	SW 7471A
Selenium, GFAA	<0.31	mg/kg dw	11/07/1998	0.31	mhp	235	561	SW 7740
Silver, AA	<2.5	mg/kg dw	11/03/1998	2.5	sep	493	570	SW 7760
UST VOLATILES NON-AQUEOUS								
Benzene	<0.006	mg/kg dw	11/03/1998	0.006	jap		74	SW 8260A
Ethylbenzene	<0.006	mg/kg dw	11/03/1998	0.006	jap		74	SW 8260A
Toluene	<0.006	mg/kg dw	11/03/1998	0.006	jap		74	SW 8260A
Xylenes, Total	<0.006	mg/kg dw	11/03/1998	0.006	jap		74	SW 8260A
Dibromofluoromethane (Surr)	87.2	%	11/03/1998	81-129	jap		74	SW 8260A
Toluene-d8 (Surr)	87.4	%	11/03/1998	74-129	jap		74	SW 8260A
4-Bromofluoromethane (Surr)	82.4	%	11/03/1998	70-130	jap		74	SW 8260A
Prep, 8310 PNAs NON-AQUEOUS	extracted		11/03/1998		mmv	767		SW 3540C
PNA CMPDS - 8310 NONAQUEOUS	ELV							
Acenaphthene	<2.0	mg/kg dw	11/05/1998	0.025	keh	767	1830	SW 8310
Acenaphthylene	<2.0	mg/kg dw	11/05/1998	0.025	keh	767	1830	SW 8310
Anthracene	<4.0	mg/kg dw	11/05/1998	0.050	keh	767	1830	SW 8310
Benzo(a)anthracene	<10	mg/kg dw	11/05/1998	0.0033	keh	767	1830	SW 8310
Benzo(b)fluoranthene	<1.9	mg/kg dw	11/05/1998	0.0045	keh	767	1830	SW 8310

ELV : Elevated reporting limits due to matrix interference.

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ANALYTICAL REPORT

Mr. Wei-Lin Feng
ENSR
740 Pasquinelli Drive
Westmont, IL 60559

11/10/1998

Sample No. : 499919

NET Job No.: 98.13879

Sample Description: B16 (0-4)
ComEd-Waukegan; 1801-023-610

Date Taken: 10/26/1998
Time Taken: 14:35
IEPA Cert. No. 100221

Date Received: 10/27/1998
Time Received: 11:00
WDNR Cert. No. 999447130

Parameter	Results	Units	Date of Analysis	Method PQL	Analyst	Batch No. Prep/Run		Analytical Method
Benzo(k)fluoranthene	<2.1	mg/kg dw	11/05/1998	0.0043	keh	767	1830	SW 8310
Benzo(a)pyrene	<2.0	mg/kg dw	11/05/1998	0.0058	keh	767	1830	SW 8310
Benzo(ghi)perylene	<4.0	mg/kg dw	11/05/1998	0.050	keh	767	1830	SW 8310
Chrysene	<3	mg/kg dw	11/05/1998	0.04	keh	767	1830	SW 8310
Dibenzo(a,h)anthracene	<0.6	mg/kg dw	11/05/1998	0.008	keh	767	1830	SW 8310
Fluoranthene	<2.0	mg/kg dw	11/05/1998	0.025	keh	767	1830	SW 8310
Fluorene	<2.0	mg/kg dw	11/05/1998	0.025	keh	767	1830	SW 8310
Indeno(1,2,3-cd)pyrene	<0.88	mg/kg dw	11/05/1998	0.011	keh	767	1830	SW 8310
Naphthalene	<2.5	mg/kg dw	11/05/1998	0.031	keh	767	1830	SW 8310
Phenanthrene	<4.0	mg/kg dw	11/05/1998	0.050	keh	767	1830	SW 8310
Pyrene	<2.0	mg/kg dw	11/05/1998	0.025	keh	767	1830	SW 8310
Surr: p-Terphenyl	Diluted out		11/05/1998	43-125	keh	767	1830	SW 8310
PCB Non-Aqueous Extraction	COMPLETE		11/02/1998	COMPLETE	wna	380		SW 3540C
PCB'S NON-AQUEOUS								
PCB-1016	<0.050	mg/kg dw	11/05/1998	0.050	tls	380	57	SW 8082
PCB-1221	<0.050	mg/kg dw	11/05/1998	0.050	tls	380	57	SW 8082
PCB-1232	<0.050	mg/kg dw	11/05/1998	0.050	tls	380	57	SW 8082
PCB-1242	<0.050	mg/kg dw	11/05/1998	0.050	tls	380	57	SW 8082
PCB-1248	<0.050	mg/kg dw	11/05/1998	0.050	tls	380	57	SW 8082
PCB-1254	0.86	mg/kg dw	11/06/1998	0.050	tls	380	56	SW 8082
PCB-1260	<0.050	mg/kg dw	11/05/1998	0.050	tls	380	57	SW 8082
Decachlorobiphenyl Surr	73.0	%	11/05/1998	NA	tls	380	57	SW 8082
2,4,5,6-TCMX (Surr	97.0	%	11/05/1998	NA	tls	380	57	SW 8082

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ANALYTICAL REPORT

Mr. Wei-Lin Feng
ENSR
740 Pasquinelli Drive
Westmont, IL 60559

11/10/1998

Sample No. : 499920

NET Job No.: 98.13879

Sample Description: B22 (0-2)
ComEd-Waukegan; 1801-023-610

Date Taken: 10/26/1998
Time Taken: 14:45
IEPA Cert. No. 100221

Date Received: 10/27/1998
Time Received: 11:00
WDNR Cert. No. 999447130

Parameter	Results		Units	Date of Analysis	Method PQL	Analyst	Batch No. Prep/Run		Analytical Method
pH, Non-Aqueous	8.02		units	10/30/1998	0.10	nwg		189	SW 9045B
Solids, Total	78.0		%	11/02/1998	0.1	efw		2515	SM 2540
Arsenic, GFAA	14		mg/kg dw	11/06/1998	0.64	mhp	235	672	SW 7060
Barium, ICP	1,050		mg/kg dw	11/07/1998	1.3	jtt	1165	2188	SW 6010B
Cadmium, ICP	1.7		mg/kg dw	11/06/1998	0.64	jtt	1165	2174	SW 6010B
Chromium, ICP	64		mg/kg dw	11/06/1998	2.6	jtt	1165	2159	SW 6010B
Lead, ICP	33		mg/kg dw	11/06/1998	5.1	jtt	1165	2397	SW 6010B
Mercury, CVAA	0.085		mg/kg dw	11/02/1998	0.051	sep	665	769	SW 7471A
Selenium, GFAA	0.92		mg/kg dw	11/07/1998	0.32	mhp	235	561	SW 7740
Silver, AA	<2.6		mg/kg dw	11/03/1998	2.6	sep	493	570	SW 7760
UST VOLATILES NON-AQUEOUS									
Benzene	<0.006		mg/kg dw	11/03/1998	0.006	jap		74	SW 8260A
Ethylbenzene	<0.006		mg/kg dw	11/03/1998	0.006	jap		74	SW 8260A
Toluene	<0.006		mg/kg dw	11/03/1998	0.006	jap		74	SW 8260A
Xylenes, Total	<0.006		mg/kg dw	11/03/1998	0.006	jap		74	SW 8260A
Dibromofluoromethane (Surr)	91.8		%	11/03/1998	81-129	jap		74	SW 8260A
Toluene-d8 (Surr)	89.2		%	11/03/1998	74-129	jap		74	SW 8260A
4-Bromofluoromethane (Surr)	91.4		%	11/03/1998	70-130	jap		74	SW 8260A
Prep, 8310 PNAs NON-AQUEOUS	extracted			11/03/1998		mmv	767		SW 3540C
PNA CMPDS - 8310 NONAQUEOUS									
Acenaphthene	<0.058	MX	mg/kg dw	11/06/1998	0.026	keh	767	1830	SW 8310
Acenaphthylene	<0.067	MX	mg/kg dw	11/06/1998	0.026	keh	767	1830	SW 8310
Anthracene	<0.22	MX	mg/kg dw	11/06/1998	0.051	keh	767	1830	SW 8310
Benzo(a)anthracene	<0.32	MX	mg/kg dw	11/06/1998	0.0033	keh	767	1830	SW 8310
Benzo(b)fluoranthene	<0.032	MX	mg/kg dw	11/06/1998	0.0046	keh	767	1830	SW 8310

MX : Dilution required due to sample matrix; analyte is not detected.

MWG13-15_45867

NATIONAL ENVIRONMENTAL TESTING, INC.

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ANALYTICAL REPORT

Mr. Wei-Lin Feng
ENSR
740 Pasquinelli Drive
Westmont, IL 60559

11/10/1998

Sample No. : 499920

NET Job No.: 98.13879

Sample Description: B22 (0-2)
ComEd-Waukegan; 1801-023-610

Date Taken: 10/26/1998
Time Taken: 14:45
IEPA Cert. No. 100221

Date Received: 10/27/1998
Time Received: 11:00
WDNR Cert. No. 999447130

Parameter	Results		Units	Date of Analysis	Method PQL	Analyst	Batch No. Prep/Run		Analytical Method
Benzo(k)fluoranthene	<0.018	MX	mg/kg dw	11/06/1998	0.0044	keh	767	1830	SW 8310
Benzo(a)pyrene	<0.054	MX	mg/kg dw	11/06/1998	0.0059	keh	767	1830	SW 8310
Benzo(ghi)perylene	<0.051		mg/kg dw	11/06/1998	0.051	keh	767	1830	SW 8310
Chrysene	<0.076	MX	mg/kg dw	11/06/1998	0.04	keh	767	1830	SW 8310
Dibenzo(a,h)anthracene	<0.019	MX	mg/kg dw	11/06/1998	0.008	keh	767	1830	SW 8310
Fluoranthene	<0.28	MX	mg/kg dw	11/06/1998	0.026	keh	767	1830	SW 8310
Fluorene	<0.14	MX	mg/kg dw	11/06/1998	0.026	keh	767	1830	SW 8310
Indeno(1,2,3-cd)pyrene	<0.046	MX	mg/kg dw	11/06/1998	0.011	keh	767	1830	SW 8310
Naphthalene	<0.032		mg/kg dw	11/06/1998	0.032	keh	767	1830	SW 8310
Phenanthrene	0.67		mg/kg dw	11/06/1998	0.051	keh	767	1830	SW 8310
Pyrene	<0.49	MX	mg/kg dw	11/06/1998	0.026	keh	767	1830	SW 8310
Surr: p-Terphenyl	Masked			11/06/1998	43-125	keh	767	1830	SW 8310
PCB Non-Aqueous Extraction	COMPLETE			11/02/1998	COMPLETE	wna	380		SW 3540C
PCB'S NON-AQUEOUS									
PCB-1016	<0.051		mg/kg dw	11/05/1998	0.051	tls	380	57	SW 8082
PCB-1221	<0.051		mg/kg dw	11/05/1998	0.051	tls	380	57	SW 8082
PCB-1232	<0.051		mg/kg dw	11/05/1998	0.051	tls	380	57	SW 8082
PCB-1242	<0.051		mg/kg dw	11/05/1998	0.051	tls	380	57	SW 8082
PCB-1248	<0.051		mg/kg dw	11/05/1998	0.051	tls	380	57	SW 8082
PCB-1254	<0.051		mg/kg dw	11/05/1998	0.051	tls	380	57	SW 8082
PCB-1260	<0.051		mg/kg dw	11/05/1998	0.051	tls	380	57	SW 8082
Decachlorobiphenyl (Surr)	73.0		%	11/05/1998	NA	tls	380	57	SW 8082
2,4,5,6-TCMX (Surr)	76.0		%	11/05/1998	NA	tls	380	57	SW 8082

MX : Dilution required due to sample matrix; analyte is not detected.

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NATIONAL ENVIRONMENTAL TESTING, INC.

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ANALYTICAL REPORT

Mr. Wei-Lin Feng
ENSR
740 Pasquinelli Drive
Westmont, IL 60559

11/10/1998

Sample No. : 499921

NET Job No.: 98.13879

Sample Description: S1
ComEd-Waukegan; 1801-023-610

Date Taken: 10/26/1998
Time Taken: 13:25
IEPA Cert. No. 100221

Date Received: 10/27/1998
Time Received: 11:00
WDNR Cert. No. 999447130

Parameter	Results		Units	Date of Analysis	Method PQL	Analyst	Batch No. Prep/Run		Analytical Method
pH, Non-Aqueous	8.35		units	10/30/1998	0.10	nwg		189	SW 9045B
Solids, Total	89.0		%	11/02/1998	0.1	efw		2515	SM 2540
Arsenic, GFAA	5.2		mg/kg dw	11/06/1998	0.56	mhp	235	672	SW 7060
Barium, ICP	236		mg/kg dw	11/07/1998	1.1	jtt	1165	2188	SW 6010B
Cadmium, ICP	2.5		mg/kg dw	11/06/1998	0.56	jtt	1165	2174	SW 6010B
Chromium, ICP	51		mg/kg dw	11/06/1998	2.2	jtt	1165	2159	SW 6010B
Lead, ICP	29		mg/kg dw	11/06/1998	4.5	jtt	1165	2397	SW 6010B
Mercury, CVAA	<0.045		mg/kg dw	11/02/1998	0.045	sep	665	769	SW 7471A
Selenium, GFAA	<0.28		mg/kg dw	11/07/1998	0.28	mhp	235	561	SW 7740
Silver, AA	<2.2		mg/kg dw	11/03/1998	2.2	sep	493	570	SW 7760
Prep, TPH 8015M - NONAQUEOUS	extracted			11/02/1998		wna	245		SW 8015M
TPH MODIFIED 8015									
TPH as Gas	<56		mg/kg dw	11/04/1998	56	out	245	491	SW 8015M
TPH as Diesel	<56		mg/kg dw	11/04/1998	56	out	245	491	SW 8015M
TPH as Oil	390	PT	mg/kg dw	11/04/1998	56	out	245	491	SW 8015M
N-octacosane (TPH surr)	85.0		%	11/04/1998		out	245	491	SW 8015M
UST VOLATILES NON-AQUEOUS									
Benzene	<0.006		mg/kg dw	11/03/1998	0.006	jap		74	SW 8260A
Ethylbenzene	<0.006		mg/kg dw	11/03/1998	0.006	jap		74	SW 8260A
Toluene	<0.006		mg/kg dw	11/03/1998	0.006	jap		74	SW 8260A
Xylenes, Total	<0.006		mg/kg dw	11/03/1998	0.006	jap		74	SW 8260A
Dibromofluoromethane (Surr)	97.4		%	11/03/1998	81-129	jap		74	SW 8260A
Toluene-d8 (Surr)	79.8		%	11/03/1998	74-129	jap		74	SW 8260A
4-Bromofluoromethane (Surr)	80.4		%	11/03/1998	70-130	jap		74	SW 8260A
Prep, 8310 PNAs NON-AQUEOUS	extracted			11/03/1998		mmv	767		SW 3540C

PT : Pattern does not match the calibration standard; however, hydrocarbons are present in the oil range

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ANALYTICAL REPORT

Mr. Wei-Lin Feng
ENSR
740 Pasquinelli Drive
Westmont, IL 60559

11/10/1998

Sample No. : 499921

NET Job No.: 98.13879

Sample Description: S1
ComEd-Waukegan; 1801-023-610

Date Taken: 10/26/1998
Time Taken: 13:25
IEPA Cert. No. 100221

Date Received: 10/27/1998
Time Received: 11:00
WDNR Cert. No. 999447130

Parameter	Results	Units	Date of Analysis	Method PQL	Analyst	Batch No. Prep/Run		Analytical Method
PNA CMPDS - 8310 NONAQUEOUS	ELV							
Acenaphthene	<1.8	mg/kg dw	11/06/1998	0.022	keh	767	1830	SW 8310
Acenaphthylene	<1.8	mg/kg dw	11/06/1998	0.022	keh	767	1830	SW 8310
Anthracene	<3.6	mg/kg dw	11/06/1998	0.045	keh	767	1830	SW 8310
Benzo(a)anthracene	13	mg/kg dw	11/06/1998	0.0029	keh	767	1830	SW 8310
Benzo(b)fluoranthene	15	mg/kg dw	11/06/1998	0.0040	keh	767	1830	SW 8310
Benzo(k)fluoranthene	8.2	mg/kg dw	11/06/1998	0.0038	keh	767	1830	SW 8310
Benzo(a)pyrene	9.7	mg/kg dw	11/06/1998	0.0052	keh	767	1830	SW 8310
Benzo(ghi)perylene	9.8	mg/kg dw	11/06/1998	0.045	keh	767	1830	SW 8310
Chrysene	17	mg/kg dw	11/06/1998	0.03	keh	767	1830	SW 8310
Dibenzo(a,h)anthracene	1.1	mg/kg dw	11/06/1998	0.007	keh	767	1830	SW 8310
Fluoranthene	34	mg/kg dw	11/06/1998	0.022	keh	767	1830	SW 8310
Fluorene	<3.5	mg/kg dw	11/06/1998	0.022	keh	767	1830	SW 8310
Indeno(1,2,3-cd)pyrene	7.6	mg/kg dw	11/06/1998	0.0097	keh	767	1830	SW 8310
Naphthalene	4.0	mg/kg dw	11/06/1998	0.028	keh	767	1830	SW 8310
Phenanthrene	13	mg/kg dw	11/06/1998	0.045	keh	767	1830	SW 8310
Pyrene	34	mg/kg dw	11/06/1998	0.022	keh	767	1830	SW 8310
Surr: p-Terphenyl	Diluted out		11/06/1998	43-125	keh	767	1830	SW 8310
PCB Non-Aqueous Extraction	COMPLETE		11/04/1998	COMPLETE	mmv	381		SW 3540C
PCB'S NON-AQUEOUS								
PCB-1016	<0.045	mg/kg dw	11/06/1998	0.045	tls	381	53	SW 8082
PCB-1221	<0.045	mg/kg dw	11/06/1998	0.045	tls	381	53	SW 8082
PCB-1232	<0.045	mg/kg dw	11/06/1998	0.045	tls	381	53	SW 8082
PCB-1242	<0.045	mg/kg dw	11/06/1998	0.045	tls	381	53	SW 8082
PCB-1248	<0.045	mg/kg dw	11/06/1998	0.045	tls	381	53	SW 8082
PCB-1254	0.063	mg/kg dw	11/06/1998	0.045	tls	381	53	SW 8082

ELV : Elevated reporting limits due to matrix interference.

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ANALYTICAL REPORT

Mr. Wei-Lin Feng
ENSR
740 Pasquinelli Drive
Westmont, IL 60559

11/10/1998

Sample No. : 499921

NET Job No.: 98.13879

Sample Description: S1
ComEd-Waukegan; 1801-023-610

Date Taken: 10/26/1998
Time Taken: 13:25
IEPA Cert. No. 100221

Date Received: 10/27/1998
Time Received: 11:00
WDNR Cert. No. 999447130

Parameter	Results	Units	Date of Analysis	Method PQL	Analyst	Batch No. Prep/Run	Analytical Method
PCB-1260	<0.045	mg/kg dw	11/06/1998	0.045	tls	381 53	SW 8082
Decachlorobiphenyl (Surr)	95.0	%	11/06/1998	NA	tls	381 53	SW 8082
2,4,5,6-TCMX (Surr)	82.0	%	11/06/1998	NA	tls	381 53	SW 8082

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QUALITY CONTROL REPORT

CONTINUING CALIBRATION VERIFICATION

ENSR
740 Pasquinelli Drive
Westmont, IL 60559

11/10/1998

NET Job Number: 98.13879

Mr. Wei-Lin Feng

Analyte	Run Batch Number	CCV True Conc.	Conc. Found	Percent Recovery
pH, Non-Aqueous	188	7.00	7.00	100.0
pH, Non-Aqueous	189	7.00	7.00	100.0
Arsenic, GFAA	672	0.0250	0.0256	102.4
Barium, ICP	2188	2.00	1.99	99.5
Barium, ICP	2188	2.00	2.03	101.5
Cadmium, ICP	2174	1.00	1.07	107.0
Chromium, ICP	2159	2.00	2.17	108.5
Lead, ICP	2397	2.00	2.11	105.5
Selenium, GFAA	561	0.0500	0.0487	97.4
Silver, AA	569	0.50	0.489	97.8
Silver, AA	570	0.50	0.515	103.0
UST VOLATILES NON-AQUEOUS				
Benzene	73	50.0	51.5	103.0
Ethylbenzene	73	50.0	50.5	101.0
Toluene	73	50.0	50.8	101.6
Xylenes, Total	73	150	151	100.7
UST VOLATILES NON-AQUEOUS				
Benzene	74	50.0	54.3	108.6
Ethylbenzene	74	50.0	52.3	104.6
Toluene	74	50.0	52.5	105.0
Xylenes, Total	74	150	157	104.7
UST VOLATILES NON-AQUEOUS				
Benzene	75	50.0	51.7	103.4
Ethylbenzene	75	50.0	52.0	104.0
Toluene	75	50.0	51.8	103.6
Xylenes, Total	75	150	155	103.3
PNA CMPDS - 8310 NONAQUEOUS				
Acenaphthene	1830	5000	4,782	95.6
Acenaphthylene	1830	5000	5,154	103.1
Anthracene	1830	5000	5,055	101.1
Benzo(a)anthracene	1830	5000	5,156	103.1
Benzo(b)fluoranthene	1830	5000	4,821	96.4
Benzo(k)fluoranthene	1830	5000	4,822	96.4
Benzo(a)pyrene	1830	5000	4,622	92.4

CCV - Continuing Calibration Verification

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QUALITY CONTROL REPORT

CONTINUING CALIBRATION VERIFICATION

ENSR
740 Pasquinelli Drive
Westmont, IL 60559

11/10/1998

NET Job Number: 98.13879

Mr. Wei-Lin Feng

Analyte	Run Batch Number	CCV True Conc.	Conc. Found	Percent Recovery
Benzo(ghi)perylene	1830	5000	4,827	96.5
Chrysene	1830	5000	5,042	100.8
Dibenzo(a,h)anthracene	1830	5000	4,938	98.8
Fluoranthene	1830	5000	4,984	99.7
Fluorene	1830	5000	4,948	99.0
Indeno(1,2,3-cd)pyrene	1830	5000	5,038	100.8
Naphthalene	1830	5000	4,671	93.4
Phenanthrene	1830	5000	5,022	100.4
Pyrene	1830	5000	4,891	97.8
Surr: p-Terphenyl	1830	5000	4,860	97.2
PNA CMPDS - 8310 NONAQUEOUS				
Acenaphthene	1830	5000	4,878	97.6
Acenaphthylene	1830	5000	5,126	102.5
Anthracene	1830	5000	5,153	103.1
Benzo(a)anthracene	1830	5000	5,200	104.0
Benzo(b)fluoranthene	1830	5000	5,126	102.5
Benzo(k)fluoranthene	1830	5000	4,981	99.6
Benzo(a)pyrene	1830	5000	4,699	94.0
Benzo(ghi)perylene	1830	5000	5,022	100.4
Chrysene	1830	5000	5,255	105.1
Dibenzo(a,h)anthracene	1830	5000	5,020	100.4
Fluoranthene	1830	5000	5,150	103.0
Fluorene	1830	5000	5,008	100.2
Indeno(1,2,3-cd)pyrene	1830	5000	5,138	102.8
Naphthalene	1830	5000	4,827	96.5
Phenanthrene	1830	5000	5,123	102.5
Pyrene	1830	5000	5,017	100.3
Surr: p-Terphenyl	1830	5000	4,999	100.0
PNA CMPDS - 8310 NONAQUEOUS				
Acenaphthene	1830	5000	4,851	97.0
Acenaphthylene	1830	5000	5,140	102.8
Anthracene	1830	5000	5,158	103.2
Benzo(a)anthracene	1830	5000	5,155	103.1
Benzo(b)fluoranthene	1830	5000	5,130	102.6

CCV - Continuing Calibration Verification

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QUALITY CONTROL REPORT

CONTINUING CALIBRATION VERIFICATION

ENSR
740 Pasquinelli Drive
Westmont, IL 60559

11/10/1998

NET Job Number: 98.13879

Mr. Wei-Lin Feng

Analyte	Run Batch Number	CCV True Conc.	Conc. Found	Percent Recovery
Benzo(k)fluoranthene	1830	5000	4,890	97.8
Benzo(a)pyrene	1830	5000	4,669	93.4
Benzo(ghi)perylene	1830	5000	5,105	102.1
Chrysene	1830	5000	5,137	102.7
Dibenzo(a,h)anthracene	1830	5000	5,065	101.3
Fluoranthene	1830	5000	5,143	102.9
Fluorene	1830	5000	5,047	100.9
Indeno(1,2,3-cd)pyrene	1830	5000	5,177	103.5
Naphthalene	1830	5000	4,747	94.9
Phenanthrene	1830	5000	5,148	103.0
Pyrene	1830	5000	5,124	102.5
Surr: p-Terphenyl	1830	5000	4,997	99.9
PNA CMPDS - 8310 NONAQUEOUS				
Acenaphthene	1833	5000	4,772	95.4
Acenaphthylene	1833	5000	5,052	101.0
Anthracene	1833	5000	5,101	102.0
Benzo(a)anthracene	1833	5000	5,100	102.0
Benzo(b)fluoranthene	1833	5000	5,023	100.5
Benzo(k)fluoranthene	1833	5000	4,833	96.7
Benzo(a)pyrene	1833	5000	4,841	96.8
Benzo(ghi)perylene	1833	5000	5,077	101.5
Chrysene	1833	5000	5,078	101.6
Dibenzo(a,h)anthracene	1833	5000	4,997	99.9
Fluoranthene	1833	5000	5,044	100.9
Fluorene	1833	5000	4,953	99.1
Indeno(1,2,3-cd)pyrene	1833	5000	5,032	100.6
Naphthalene	1833	5000	4,652	93.0
Phenanthrene	1833	5000	5,042	100.8
Pyrene	1833	5000	4,907	98.1
Surr: p-Terphenyl	1833	5000	4,856	97.1
PNA CMPDS - 8310 NONAQUEOUS				
Acenaphthene	1833	5000	4,848	97.0
Acenaphthylene	1833	5000	5,219	104.4
Anthracene	1833	5000	5,161	103.2

CCV - Continuing Calibration Verification

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QUALITY CONTROL REPORT

CONTINUING CALIBRATION VERIFICATION

ENSR
740 Pasquinelli Drive
Westmont, IL 60559

11/10/1998

NET Job Number: 98.13879

Mr. Wei-Lin Feng

Analyte	Run Batch Number	CCV True Conc.	Conc. Found	Percent Recovery
Benzo(a)anthracene	1833	5000	5,266	105.3
Benzo(b)fluoranthene	1833	5000	4,961	99.2
Benzo(k)fluoranthene	1833	5000	4,980	99.6
Benzo(a)pyrene	1833	5000	4,874	97.5
Benzo(ghi)perylene	1833	5000	5,175	103.5
Chrysene	1833	5000	5,175	103.5
Dibenzo(a,h)anthracene	1833	5000	5,114	102.3
Fluoranthene	1833	5000	5,133	102.7
Fluorene	1833	5000	5,041	100.8
Indeno(1,2,3-cd)pyrene	1833	5000	5,070	101.4
Naphthalene	1833	5000	4,767	95.3
Phenanthrene	1833	5000	5,120	102.4
Pyrene	1833	5000	4,980	99.6
Surr: p-Terphenyl	1833	5000	4,976	99.5
PNA CMPDS - 8310 NONAQUEOUS				
Acenaphthene	1833	5000	4,815	96.3
Acenaphthylene	1833	5000	5,143	102.9
Anthracene	1833	5000	5,176	103.5
Benzo(a)anthracene	1833	5000	5,204	104.1
Benzo(b)fluoranthene	1833	5000	5,071	101.4
Benzo(k)fluoranthene	1833	5000	4,923	98.5
Benzo(a)pyrene	1833	5000	4,957	99.1
Benzo(ghi)perylene	1833	5000	5,149	103.0
Chrysene	1833	5000	5,232	104.6
Dibenzo(a,h)anthracene	1833	5000	5,058	101.2
Fluoranthene	1833	5000	5,090	101.8
Fluorene	1833	5000	5,015	100.3
Indeno(1,2,3-cd)pyrene	1833	5000	5,098	102.0
Naphthalene	1833	5000	4,759	95.2
Phenanthrene	1833	5000	5,135	102.7
Pyrene	1833	5000	5,004	100.1
Surr: p-Terphenyl	1833	5000	5,030	100.6
PNA CMPDS - 8310 NONAQUEOUS				
Acenaphthene	1833	5000	4,926	98.5

CCV - Continuing Calibration Verification

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QUALITY CONTROL REPORT

CONTINUING CALIBRATION VERIFICATION

ENSR
740 Pasquinelli Drive
Westmont, IL 60559

11/10/1998

NET Job Number: 98.13879

Mr. Wei-Lin Feng

Analyte	Run Batch Number	CCV True Conc.	Conc. Found	Percent Recovery
Acenaphthylene	1833	5000	5,116	102.3
Anthracene	1833	5000	5,182	103.6
Benzo(a)anthracene	1833	5000	5,207	104.1
Benzo(b)fluoranthene	1833	5000	4,911	98.2
Benzo(k)fluoranthene	1833	5000	4,858	97.2
Benzo(a)pyrene	1833	5000	4,927	98.5
Benzo(ghi)perylene	1833	5000	5,045	100.9
Chrysene	1833	5000	5,186	103.7
Dibenzo(a,h)anthracene	1833	5000	5,114	102.3
Fluoranthene	1833	5000	5,120	102.4
Fluorene	1833	5000	5,038	100.8
Indeno(1,2,3-cd)pyrene	1833	5000	5,132	102.6
Naphthalene	1833	5000	4,745	94.9
Phenanthrene	1833	5000	5,144	102.9
Pyrene	1833	5000	5,045	100.9
Surr: p-Terphenyl	1833	5000	4,911	98.2
PCB'S NON-AQUEOUS				
PCB-1016	53	500	434	86.8
PCB-1260	53	500	442	88.4
PCB'S NON-AQUEOUS				
PCB-1016	53	500	447	89.4
PCB-1260	53	500	460	92.0
PCB'S NON-AQUEOUS				
PCB-1016	53	500	447	89.4
PCB-1260	53	500	460	92.0
PCB'S NON-AQUEOUS				
PCB-1016	53	500	479	95.8
PCB-1260	53	500	484	96.8
PCB'S NON-AQUEOUS				
PCB-1016	53	500	475	95.0
PCB-1260	53	500	459	91.8
PCB'S NON-AQUEOUS				
PCB'S NON-AQUEOUS				
PCB'S NON-AQUEOUS				

CCV - Continuing Calibration Verification

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QUALITY CONTROL REPORT

CONTINUING CALIBRATION VERIFICATION

ENSR
740 Pasquinelli Drive
Westmont, IL 60559

11/10/1998

NET Job Number: 98.13879

Mr. Wei-Lin Feng

Analyte	Run Batch Number	CCV True Conc.	Conc. Found	Percent Recovery
PCB-1016	57	500	487	97.4
PCB-1260	57	500	440	88.0
PCB'S NON-AQUEOUS				
PCB-1016	57	500	543	108.6
PCB-1260	57	500	527	105.4

CCV - Continuing Calibration Verification

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QUALITY CONTROL REPORT

BLANK ANALYSIS

ENSR
740 Pasquinelli Drive
Westmont, IL 60559

11/10/1998

NET Job Number: 98.13879

Mr. Wei-Lin Feng

Analyte	Prep Batch Number	Run Batch Number	Blank Analysis Results	Units	Reporting Limit	Analytical Method
Arsenic, GFAA	235	672	<0.50	mg/Kg	0.50	SW 7060
Barium, ICP	1165	2188	<1.0	mg/Kg	1.0	SW 6010B
Cadmium, ICP	1165	2174	<0.50	mg/Kg	0.50	SW 6010B
Chromium, ICP	1165	2159	<2.0	mg/Kg	2.0	SW 6010B
Lead, ICP	1165	2397	<4.0	mg/Kg	4.0	SW 6010B
Selenium, GFAA	235	561	<0.25	mg/Kg	0.25	SW 7740
Silver, AA	492	569	<2.0	mg/Kg	2.0	SW 7760
Silver, AA	493	570	<2.0	mg/Kg	2.0	SW 7760
UST VOLATILES NON-AQUEOUS						SW 8260A
Benzene		74	<0.005	mg/Kg	0.005	SW 8260A
Ethylbenzene		74	<0.005	mg/Kg	0.005	SW 8260A
Toluene		74	<0.005	mg/Kg	0.005	SW 8260A
Xylenes, Total		74	<0.005	mg/Kg	0.005	SW 8260A
Dibromofluoromethane (Surr)		74	77.0	%	81-129	SW 8260A
Toluene-d8 (Surr)		74	81.2	%	74-129	SW 8260A
4-Bromofluoromethane (Surr)		74	87.4	%	70-130	SW 8260A
UST VOLATILES NON-AQUEOUS						SW 8260A
Benzene		75	<0.005	mg/Kg	0.005	SW 8260A
Ethylbenzene		75	<0.005	mg/Kg	0.005	SW 8260A
Toluene		75	<0.005	mg/Kg	0.005	SW 8260A
Xylenes, Total		75	<0.005	mg/Kg	0.005	SW 8260A
Dibromofluoromethane (Surr)		75	90.6	%	81-129	SW 8260A
Toluene-d8 (Surr)		75	97.2	%	74-129	SW 8260A
4-Bromofluoromethane (Surr)		75	103.0	%	70-130	SW 8260A
PNA CMPDS - 8310 NONAQUEOUS						SW 8310
Acenaphthene	767	1826	<0.020	mg/Kg	0.020	SW 8310
Acenaphthylene	767	1826	<0.020	mg/Kg	0.020	SW 8310
Anthracene	767	1826	<0.040	mg/Kg	0.040	SW 8310
Benzo(a)anthracene	767	1826	<0.0026	mg/Kg	0.0026	SW 8310

Advisory Control Limits for Blanks:

All compounds should be less than the Reporting Limit, except for phthalate esters, toluene, methylene chloride, acetone and chloroform should be less than 5 times the Reporting Limit.

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NATIONAL ENVIRONMENTAL TESTING, INC.

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QUALITY CONTROL REPORT

BLANK ANALYSIS

ENSR
740 Pasquinelli Drive
Westmont, IL 60559

11/10/1998

NET Job Number: 98.13879

Mr. Wei-Lin Feng

Analyte	Prep Batch Number	Run Batch Number	Blank Analysis Results	Units	Reporting Limit	Analytical Method
Benzo(b)fluoranthene	767	1826	<0.0036	mg/Kg	0.0036	SW 8310
Benzo(k)fluoranthene	767	1826	<0.0034	mg/Kg	0.0034	SW 8310
Benzo(a)pyrene	767	1826	<0.0046	mg/Kg	0.0046	SW 8310
Benzo(ghi)perylene	767	1826	<0.040	mg/Kg	0.040	SW 8310
Chrysene	767	1826	<0.03	mg/Kg	0.03	SW 8310
Dibenzo(a,h)anthracene	767	1826	<0.006	mg/Kg	0.006	SW 8310
Fluoranthene	767	1826	<0.020	mg/Kg	0.020	SW 8310
Fluorene	767	1826	<0.020	mg/Kg	0.020	SW 8310
Indeno(1,2,3-cd)pyrene	767	1826	<0.0086	mg/Kg	0.0086	SW 8310
Naphthalene	767	1826	<0.025	mg/Kg	0.025	SW 8310
Phenanthrene	767	1826	<0.040	mg/Kg	0.040	SW 8310
Pyrene	767	1826	<0.020	mg/Kg	0.020	SW 8310
Surr: p-Terphenyl	767	1826	86.2	%	43-125	SW 8310
PNA CMPDS - 8310 NONAQUEOUS						SW 8310
Acenaphthene	767	1830	<0.020	mg/Kg	0.020	SW 8310
Acenaphthylene	767	1830	<0.020	mg/Kg	0.020	SW 8310
Anthracene	767	1830	<0.040	mg/Kg	0.040	SW 8310
Benzo(a)anthracene	767	1830	<0.0026	mg/Kg	0.0026	SW 8310
Benzo(b)fluoranthene	767	1830	<0.0036	mg/Kg	0.0036	SW 8310
Benzo(k)fluoranthene	767	1830	<0.0034	mg/Kg	0.0034	SW 8310
Benzo(a)pyrene	767	1830	<0.0046	mg/Kg	0.0046	SW 8310
Benzo(ghi)perylene	767	1830	<0.040	mg/Kg	0.040	SW 8310
Chrysene	767	1830	<0.03	mg/Kg	0.03	SW 8310
Dibenzo(a,h)anthracene	767	1830	<0.006	mg/Kg	0.006	SW 8310
Fluoranthene	767	1830	<0.020	mg/Kg	0.020	SW 8310
Fluorene	767	1830	<0.020	mg/Kg	0.020	SW 8310
Indeno(1,2,3-cd)pyrene	767	1830	<0.0086	mg/Kg	0.0086	SW 8310
Naphthalene	767	1830	<0.025	mg/Kg	0.025	SW 8310
Phenanthrene	767	1830	<0.040	mg/Kg	0.040	SW 8310

Advisory Control Limits for Blanks:

All compounds should be less than the Reporting Limit, except for phthalate esters, toluene, methylene chloride, acetone and chloroform should be less than 5 times the Reporting Limit.

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BLANK ANALYSIS

ENSR
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Westmont, IL 60559

11/10/1998

NET Job Number: 98.13879

Mr. Wei-Lin Feng

Analyte	Prep Batch Number	Run Batch Number	Blank Analysis Results	Units	Reporting Limit	Analytical Method
Pyrene	767	1830	<0.020	mg/Kg	0.020	SW 8310
Surr: p-Terphenyl	767	1830	90.3	%	43-125	SW 8310
PNA CMPDS - 8310 NONAQUEOUS						SW 8310
Acenaphthene	770	1833	<0.020	mg/Kg	0.020	SW 8310
Acenaphthylene	770	1833	<0.020	mg/Kg	0.020	SW 8310
Anthracene	770	1833	<0.040	mg/Kg	0.040	SW 8310
Benzo(a)anthracene	770	1833	<0.0026	mg/Kg	0.0026	SW 8310
Benzo(b)fluoranthene	770	1833	<0.0036	mg/Kg	0.0036	SW 8310
Benzo(k)fluoranthene	770	1833	<0.0034	mg/Kg	0.0034	SW 8310
Benzo(a)pyrene	770	1833	<0.0046	mg/Kg	0.0046	SW 8310
Benzo(ghi)perylene	770	1833	<0.040	mg/Kg	0.040	SW 8310
Chrysene	770	1833	<0.03	mg/Kg	0.03	SW 8310
Dibenzo(a,h)anthracene	770	1833	<0.006	mg/Kg	0.006	SW 8310
Fluoranthene	770	1833	<0.020	mg/Kg	0.020	SW 8310
Fluorene	770	1833	<0.020	mg/Kg	0.020	SW 8310
Indeno(1,2,3-cd)pyrene	770	1833	<0.0086	mg/Kg	0.0086	SW 8310
Naphthalene	770	1833	<0.025	mg/Kg	0.025	SW 8310
Phenanthrene	770	1833	<0.040	mg/Kg	0.040	SW 8310
Pyrene	770	1833	<0.020	mg/Kg	0.020	SW 8310
Surr: p-Terphenyl	770	1833	77.9	%	43-125	SW 8310
PCB'S NON-AQUEOUS						SW 8082
PCB-1016	380	52	<0.040	mg/Kg	0.040	SW 8082
PCB-1221	380	52	<0.040	mg/Kg	0.040	SW 8082
PCB-1232	380	52	<0.040	mg/Kg	0.040	SW 8082
PCB-1242	380	52	<0.040	mg/Kg	0.040	SW 8082
PCB-1248	380	52	<0.040	mg/Kg	0.040	SW 8082
PCB-1254	380	52	<0.040	mg/Kg	0.040	SW 8082
PCB-1260	380	52	<0.040	mg/Kg	0.040	SW 8082
Decachlorobiphenyl (Surr)	380	52	80.0	%	NA	SW 8082

Advisory Control Limits for Blanks:

All compounds should be less than the Reporting Limit, except for phthalate esters, toluene, methylene chloride, acetone and chloroform should be less than 5 times the Reporting Limit.

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QUALITY CONTROL REPORT

BLANK ANALYSIS

ENSR
740 Pasquinelli Drive
Westmont, IL 60559

11/10/1998

NET Job Number: 98.13879

Mr. Wei-Lin Feng

Analyte	Prep Batch Number	Run Batch Number	Blank Analysis Results	Units	Reporting Limit	Analytical Method
2,4,5,6-TCMX (Surr)	380	52	78.0	%	NA	SW 8082
PCB'S NON-AQUEOUS						SW 8082
PCB-1016	381	53	<0.040	mg/Kg	0.040	SW 8082
PCB-1221	381	53	<0.040	mg/Kg	0.040	SW 8082
PCB-1232	381	53	<0.040	mg/Kg	0.040	SW 8082
PCB-1242	381	53	<0.040	mg/Kg	0.040	SW 8082
PCB-1248	381	53	<0.040	mg/Kg	0.040	SW 8082
PCB-1254	381	53	<0.040	mg/Kg	0.040	SW 8082
PCB-1260	381	53	<0.040	mg/Kg	0.040	SW 8082
Decachlorobiphenyl (Surr)	381	53	84.0	%	NA	SW 8082
2,4,5,6-TCMX (Surr)	381	53	67.0	%	NA	SW 8082

Advisory Control Limits for Blanks:

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QUALITY CONTROL REPORT

LABORATORY CONTROL STANDARD

ENSR
740 Pasquinelli Drive
Westmont, IL 60559

11/10/1998

NET Job Number: 98.13879

Mr. Wei-Lin Feng

Analyte	Prep Batch Number	Run Batch Number	True Conc.	Conc. Found	LCS % Recovery
Arsenic, GFAA	235	672	0.0100	0.0091	91.0
Barium, ICP	1165	2188	5.00	5.18	103.6
Cadmium, ICP	1165	2174	2.50	2.48	99.2
Chromium, ICP	1165	2159	5.00	5.05	101.0
Lead, ICP	1165	2397	5.00	4.75	95.0
Selenium, GFAA	235	561	0.0100	0.0104	104.0
Silver, AA	492	569	0.10	0.084	84.0
Silver, AA	493	570	1.0	0.958	95.8
Silver, AA		570	0.10	0.095	95.0
TPH MODIFIED 8015					
TPH as Gas	245	486	250	225	90.0
TPH as Diesel	245	486	250	216	86.4
TPH as Oil	245	486	250	201	80.4
N-octacosane (TPH surr)	245	486	100	117	117.0
UST VOLATILES NON-AQUEOUS					
Benzene		73	20.0	21.2	106.0
Ethylbenzene		73	20.0	20.7	103.5
Toluene		73	20.0	19.9	99.5
Xylenes, Total		73	60.0	60.8	101.3
Dibromofluoromethane (Surr)		73	50.0	48.3	96.6
Toluene-d8 (Surr)		73	50.0	52.6	105.2
4-Bromofluoromethane (Surr)		73	50.0	53.4	106.8
UST VOLATILES NON-AQUEOUS					
Benzene		74	20.0	20.5	102.5
Ethylbenzene		74	20.0	20.6	103.0
Toluene		74	20.0	19.8	99.0
Xylenes, Total		74	60.0	61.0	101.7
Dibromofluoromethane (Surr)		74	50.0	45.7	91.4
Toluene-d8 (Surr)		74	50.0	45.9	91.8
4-Bromofluoromethane (Surr)		74	50.0	50.2	100.4
UST VOLATILES NON-AQUEOUS					

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QUALITY CONTROL REPORT

LABORATORY CONTROL STANDARD

ENSR
740 Pasquinelli Drive
Westmont, IL 60559

11/10/1998

NET Job Number: 98.13879

Mr. Wei-Lin Feng

Analyte	Prep Batch Number	Run Batch Number	True Conc.	Conc. Found	LCS % Recovery
Benzene		75	20.0	19.5	97.5
Ethylbenzene		75	20.0	20.1	100.5
Toluene		75	20.0	18.9	94.5
Xylenes, Total		75	60.0	58.7	97.8
Dibromofluoromethane (Surr)		75	50.0	45.5	91.0
Toluene-d8 (Surr)		75	50.0	49.3	98.6
4-Bromofluoromethane (Surr)		75	50.0	50.7	101.4
PNA CMPDS - 8310 NONAQUEOUS					
Acenaphthene	767	1828	0.033	0.027	81.8
Acenaphthylene	767	1828	0.033	0.028	84.8
Anthracene	767	1828	0.033	0.029	87.9
Benzo(a)anthracene	767	1828	0.033	0.027	81.8
Benzo(b)fluoranthene	767	1828	0.033	0.027	81.8
Benzo(k)fluoranthene	767	1828	0.033	0.028	84.8
Benzo(a)pyrene	767	1828	0.033	0.027	81.8
Benzo(ghi)perylene	767	1828	0.033	0.030	90.9
Chrysene	767	1828	0.033	0.029	87.9
Dibenzo(a,h)anthracene	767	1828	0.033	0.028	84.8
Fluoranthene	767	1828	0.033	0.029	87.9
Fluorene	767	1828	0.033	0.031	93.9
Indeno(1,2,3-cd)pyrene	767	1828	0.033	0.028	84.8
Naphthalene	767	1828	0.033	0.031	93.9
Phenanthrene	767	1828	0.033	0.029	87.9
Pyrene	767	1828	0.033	0.033	100.0
Surr: p-Terphenyl	767	1828	2000	1,613	80.7
PNA CMPDS - 8310 NONAQUEOUS					
Acenaphthene	767	1830	0.033	0.032	97.0
Acenaphthylene	767	1830	0.033	0.030	90.9
Anthracene	767	1830	0.033	0.030	90.9
Benzo(a)anthracene	767	1830	0.033	0.031	93.9
Benzo(b)fluoranthene	767	1830	0.033	0.033	100.0

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QUALITY CONTROL REPORT

LABORATORY CONTROL STANDARD

ENSR
740 Pasquinelli Drive
Westmont, IL 60559

11/10/1998

NET Job Number: 98.13879

Mr. Wei-Lin Feng

Analyte	Prep Batch Number	Run Batch Number	True Conc.	Conc. Found	LCS % Recovery
Benzo(k)fluoranthene	767	1830	0.033	0.029	87.9
Benzo(a)pyrene	767	1830	0.033	0.027	81.8
Benzo(ghi)perylene	767	1830	0.033	0.029	87.9
Chrysene	767	1830	0.033	0.031	93.9
Dibenzo(a,h)anthracene	767	1830	0.033	0.029	87.9
Fluoranthene	767	1830	0.033	0.032	97.0
Fluorene	767	1830	0.033	0.029	87.9
Indeno(1,2,3-cd)pyrene	767	1830	0.033	0.030	90.9
Naphthalene	767	1830	0.033	0.023	69.7
Phenanthrene	767	1830	0.033	0.030	90.9
Pyrene	767	1830	0.033	0.031	93.9
Surr: p-Terphenyl	767	1830	2000	1,705	85.3
PNA CMPDS - 8310 NONAQUEOUS					
Acenaphthene	770	1833	0.033	0.030	90.9
Acenaphthylene	770	1833	0.033	0.030	90.9
Anthracene	770	1833	0.033	0.030	90.9
Benzo(a)anthracene	770	1833	0.033	0.030	90.9
Benzo(b)fluoranthene	770	1833	0.033	0.029	87.9
Benzo(k)fluoranthene	770	1833	0.033	0.029	87.9
Benzo(a)pyrene	770	1833	0.033	0.029	87.9
Benzo(ghi)perylene	770	1833	0.033	0.030	90.9
Chrysene	770	1833	0.033	0.029	87.9
Dibenzo(a,h)anthracene	770	1833	0.033	0.030	90.9
Fluoranthene	770	1833	0.033	0.030	90.9
Fluorene	770	1833	0.033	0.029	87.9
Indeno(1,2,3-cd)pyrene	770	1833	0.033	0.030	90.9
Naphthalene	770	1833	0.033	0.026	78.8
Phenanthrene	770	1833	0.033	0.030	90.9
Pyrene	770	1833	0.033	0.030	90.9
Surr: p-Terphenyl	770	1833	2000	1,662	83.1
PCB'S NON-AQUEOUS					

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QUALITY CONTROL REPORT

LABORATORY CONTROL STANDARD

ENSR
740 Pasquinelli Drive
Westmont, IL 60559

11/10/1998

NET Job Number: 98.13879

Mr. Wei-Lin Feng

Analyte	Prep Batch Number	Run Batch Number	True Conc.	Conc. Found	LCS % Recovery
PCB-1016	380	52	500	448	89.6
PCB-1260	380	52	500	452	90.4
Decachlorobiphenyl (Surr)	380	52	100	86	86.0
2,4,5,6-TCMX (Surr)	380	52	100	80	80.0
PCB'S NON-AQUEOUS					
PCB-1016	381	53	500	440	88.0
PCB-1260	381	53	500	454	90.8
Decachlorobiphenyl (Surr)	381	53	100	92	92.0
2,4,5,6-TCMX (Surr)	381	53	100	81	81.0

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QUALITY CONTROL REPORT

DUPLICATES

ENSR
740 Pasquinelli Drive
Westmont, IL 60559

Mr. Wei-Lin Feng

11/10/1998

NET Job Number: 98.13879

Analyte	Prep Batch Number	Run Batch Number	Original Analysis	Duplicate Analysis	Units	RPD
pH, Non-Aqueous		188	7.55	7.46	units	1.2
pH, Non-Aqueous		189	7.50	7.48	units	0.3
Solids, Total		2515	66.8	69.9	%	4.5
Solids, Total		2515	95.0	95.2	%	0.2
Solids, Total		2515	89.0	89.7	%	0.8

NOTE: Spikes and Duplicates may not be samples from this job.

RPD - Relative Percent Difference

Advisory Control Limits for Duplicates - RPD should be less than 20.

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NET Midwest, Bartlett Division

KEY TO ABBREVIATIONS and METHOD REFERENCES

<	:	Less than; When appearing in the results column indicates the analyte was not detected at or above the reported value.
mg/L	:	Concentration in units of milligrams of analyte per liter of sample. Measurement used for aqueous samples. Can also be expressed as parts per million (ppm).
ug/g	:	Concentration in units of micrograms of analyte per gram of sample. Measurement used for non-aqueous samples. Can also be expressed as parts per million (ppm) or mg/Kg.
ug/L	:	Concentration in units of micrograms of analyte per liter of sample. Measurement used for aqueous samples. Can also be expressed as parts per billion (ppb).
ug/Kg	:	Concentration in units of micrograms of analyte per kilogram of sample. Measurement used for non-aqueous samples. Can also be expressed as parts per billion (ppb).
TCLP	:	These initials appearing in front of an analyte name indicate that the Toxicity Characteristic Leaching Procedure (TCLP) was performed for this test.
Surr:	:	These initials are the abbreviation for surrogate. Surrogates are compounds that are chemically similar to the compounds of interest. They are part of the method quality control requirements.
%	:	Percent; To convert ppm to %, divide the result by 10,000. To convert % to ppm, multiply the result by 10,000.
ICP	:	Indicates analysis was performed using Inductively Coupled Plasma Spectroscopy.
AA	:	Indicates analysis was performed using Atomic Absorption Spectroscopy.
GFAA	:	Indicates analysis was performed using Graphite Furnace Atomic Absorption Spectroscopy.
PQL	:	Practical Quantitation Limit; the lowest level that can be reliably achieved within specified limits of precision and accuracy during routine laboratory operating conditions.

Method References

(1) Methods 1000 through 9999: see "Test Methods for Evaluating Solid Waste", USEPA SW-846, 3rd Edition, 1986.

(2) ASTM "American Society for Testing Materials"

(3) Methods 100 through 499: see "Methods for Chemical Analysis of Water and Wastes", USEPA, 600/4-79-020, Rev. 1983.

(4) See "Standard Methods for the Examination of Water and Wastewater", 17th Ed, APHA, 1989.

(5) Methods 600 through 625: see "Guidelines Establishing Test Procedures for the Analysis of Pollutants", USEPA Federal Register Vol. 49 No. 209, October 1984.

(6) Methods 500 through 599: see "Methods for the Determination of Organic Compounds in Drinking Water," USEPA 600/4-88/039, Rev. 1988.

(7) See "Methods for the Determination of Metals in Environmental Samples", Supplement I EPA-600/R-94/111, May 1994.

(8) See "Standard Methods for the Examination of Water and Wastewater", 18th Ed., APHA, 1992.

(9) Methods 1000 through 9999: see "Test Methods for Evaluating Solid Waste", USEPA SW-846, 3rd Edition, 1986, Including Updates I and II.

(10) This method is from the 2nd Edition of "Test Methods for Evaluating Solid Waste", USEPA SW-846. It has been dropped from the 3rd Edition, 1986.

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NET NATIONAL ENVIRONMENTAL TESTING, INC.

CHAIN OF CUSTODY RECORD

COMPANY: ENSR Corp.
ADDRESS: 740 Pasquinelli Dr. St. 124 Westmont, IL
PHONE: (630) 887 1700 FAX: 630 850 5307
PROJECT NAME/LOCATION: ComEd / Waukegan
PROJECT NUMBER: 1801.023.610
PROJECT MANAGER: Weilin Feng / Karen Dolnicks

REPORT TO: K. Dolnicks
INVOICE TO: ENSR
P.O. NO.:
NET QUOTE NO.:

SAMPLED BY (PRINT NAME): B. Buckley — SIGNATURE: B Buckley
(PRINT NAME): — SIGNATURE:

DATE 1998	TIME	SAMPLE ID/DESCRIPTION	MATRIX	GRAB	COMP	# and Type of Containers: HCl	NaOH	HNO_3	H_2SO_4	OTHER	ANALYSES: TPH 9045	PNAs 8310	BTEX 8260	PCBs 8081	TPH 8015	RCRA Metals (4 total)					
10/26	1015	B21 (0-4)	S	X							X	X	X	X	X	X				
10/26	1052	B20 (0-4)	S	X							X	X	X	X		X				
10/26	1112	B19 (0-4)	S	X							X	X	X	X		X				
10/26	1120	B4 (0-4)	S	X							X	X	X	X		X				
10/26	1315	B2 (0-4)	S	X							X	X	X	X		X				
10/26	1325	B1	S	X							X	X	X	X	X	X				
10/26	1340	B13 (0-4)	S	X							X	X	X	X		X				
10/26	1415	B14 (0-4)	S	X							X	X	X	X		X				
10/26	1435	B16 (0-4)	S	X							X	X	X	X		X				
10/26	1445	B22 (0-2)	S	X							X	X	X	X		X				

To assist us in selecting the proper method

Is this work being conducted for regulatory compliance monitoring? Yes ___ No ___

Is this work being conducted for regulatory enforcement action? Yes ___ No ___

Which regulations apply: RCRA ___ NPDES Wastewater ___ UST ___ Drinking Water ___ Other ___ None ___

COMMENTS: NO TPH - mistake

CONDITION OF SAMPLE: BOTTLES INTACT? (YES) / NO FIELD FILTERED? YES / (NO)
COC SEALS PRESENT AND INTACT? (YES) / NO VOLATILES FREE OF HEADSPACE? (YES) / NO
TEMPERATURE UPON RECEIPT: 0°C Wet Ice Bottles supplied by NET? (YES) / NO

SAMPLE REMAINDER DISPOSAL: RETURN SAMPLE REMAINDER TO CLIENT VIA ___
I REQUEST NET TO DISPOSE OF ALL SAMPLE REMAINDERS ___ DATE ___

RELINQUISHED BY	DATE	TIME	RECEIVED BY:	RELINQUISHED BY:	DATE	TIME	RECEIVED FOR NET BY:
B. Buckley	10/26/98	1600			10/27/98	11:00	J. O'Dell

METHOD OF SHIPMENT: fedex
REMARKS:

PT 1 - ORIGINAL - WHITE PT 2 - NET PROJECT MANAGER - YELLOW PT 3 - CUSTOMER COPY - PINK

NATIONAL ENVIRONMENTAL TESTING, INC.

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(800) 807-2877

Mr. Wei-Lin Feng
ENSR
740 Pasquinelli Drive
Westmont, IL 60559

11/10/1998

NET Job Number: 98.14078

IEPA Cert. No.: 100221
WDNR Cert. No.: 999447130
A2LA Cert. No.: 0453-01

Enclosed is the Analytical and Quality Control reports for the following samples submitted to Bartlett Division of NET, Inc. for analysis.

Project Description: ComEd-Waukegan; 1801-023-610

Sample Number	Sample Description	Date Taken	Date Received
500692	MW-1	10/29/1998	10/30/1998
500693	MW-2	10/29/1998	10/30/1998
500694	MW-3	10/29/1998	10/30/1998
500695	MW-4	10/29/1998	10/30/1998
500696	MW-5	10/29/1998	10/30/1998
500697	MW-6	10/29/1998	10/30/1998
500698	MW-7	10/29/1998	10/30/1998

Sample analysis in support of the project referenced above has been completed and results are presented on the following pages. These results apply only to the samples analyzed. Reproduction of this report only in whole is permitted. Please refer to the enclosed "Key to Abbreviations" for definition of terms. Procedures used follow NET Standard Operating Procedures which reference the methods listed on your report. Should you have questions regarding procedures or results, please do not hesitate to call. NET has been pleased to provide these analytical services for you.

This Quality Control report is generated on a batch basis. All information contained in this report is for the analytical batch(es) in which your sample(s) were analyzed.

Approved by:

Mary Pearson

Mary Pearson
Project Manager

Electronic Filing: Received, Clerk's Office 10/31/2022

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ANALYTICAL REPORT

Mr. Wei-Lin Feng
ENSR
740 Pasquinelli Drive
Westmont, IL 60559

11/10/1998

Sample No. : 500692

NET Job No.: 98.14078

Sample Description: MW-1
ComEd-Waukegan; 1801-023

Date Taken: 10/29/1998
Time Taken: 11:15
IEPA Cert. No. 100221

Date Received: 10/30/1998
Time Received: 12:45
WDNR Cert. No. 999447130

Parameter	Results	Units	Date of Analysis	Method PQL	Analyst	Batch No. Prep/Run	Analytical Method
pH	7.07	units	10/30/1998	0.10	efw	1719	EPA 150.1
Arsenic, GFAA	1.1	mg/L	11/09/1998	0.0050	out	1358 1148	SW 7060
Barium, ICP	0.031	mg/L	11/05/1998	0.020	kdw	2201 3769	SW 6010B
Cadmium, ICP	0.034	mg/L	11/05/1998	0.010	kdw	2201 3737	SW 6010B
Chromium, ICP	<0.040	mg/L	11/05/1998	0.040	kdw	2201 3746	SW 6010B
Lead, GFAA	<0.0050	mg/L	11/05/1998	0.0050	out	1358 2174	SW 7421
Mercury, CVAA	<0.0002	mg/L	11/05/1998	0.0002	sep	1187 1093	SW 7470A
Selenium, GFAA	<0.0050	mg/L	11/06/1998	0.0050	out	1358 859	SW 7740
Silver, AA	<0.040	mg/L	11/06/1998	0.040	sep	1016 995	SW 7760
Prep, PCBs 8082 Aqueous	COMPLETE		11/05/1998		wna	371	SW 3510C
PCBs 8082 Aqueous							
PCB-1016	<0.0005	mg/L	11/06/1998	0.0005	tls	371 703	SW 8082
PCB-1221	<0.0005	mg/L	11/06/1998	0.0005	tls	371 703	SW 8082
PCB-1232	<0.0005	mg/L	11/06/1998	0.0005	tls	371 703	SW 8082
PCB-1242	<0.0005	mg/L	11/06/1998	0.0005	tls	371 703	SW 8082
PCB-1248	<0.0005	mg/L	11/06/1998	0.0005	tls	371 703	SW 8082
PCB-1254	<0.0005	mg/L	11/06/1998	0.0005	tls	371 703	SW 8082
PCB-1260	<0.0005	mg/L	11/06/1998	0.0005	tls	371 703	SW 8082
Surr: Tetrachloroxylene (TCX)	75.0	%	11/06/1998	22-154	tls	371 703	SW 8082
Surr: Decachlorobiphenyl (DCB)	73.0	%	11/06/1998	23-154	tls	371 703	SW 8082

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ANALYTICAL REPORT

Mr. Wei-Lin Feng
ENSR
740 Pasquinelli Drive
Westmont, IL 60559

11/10/1998

Sample No. : 500692

NET Job No.: 98.14078

Sample Description: MW-1
ComEd-Waukegan; 1801-023

Date Taken: 10/29/1998
Time Taken: 11:15
IEPA Cert. No. 100221

Date Received: 10/30/1998
Time Received: 12:45
WDNR Cert. No. 999447130

Parameter	Results	Units	Date of Analysis	Method PQL	Analyst	Batch No. Prep/Run		Analytical Method
UST VOLATILES 8260 - AQUEOUS								
Benzene	<0.001	mg/L	11/07/1998	0.001	mjo		2642	SW 8260A
Ethyl Benzene	<0.001	mg/L	11/07/1998	0.001	mjo		2642	SW 8260A
Toluene	<0.001	mg/L	11/07/1998	0.001	mjo		2642	SW 8260A
Xylenes, Total	<0.001	mg/L	11/07/1998	0.001	mjo		2642	SW 8260A
Surr: Toluene-d8	104.8	%	11/07/1998	85-117	mjo		2642	SW 8260A
Surr: Bromofluorobenzene	103.0	%	11/07/1998	80-116	mjo		2642	SW 8260A
Surr: Dibromofluoromethane	99.0	%	11/07/1998	75-130	mjo		2642	SW 8260A
Prep, 8310 PNAs AQUEOUS	extracted		11/04/1998		mmv	409		SW 3520C
PNA CMPDS - 8310 AQUEOUS								
Acenaphthene	<0.0005	mg/L	11/07/1998	0.0005	keh	409	1207	SW 8310
Acenaphthylene	<0.0005	mg/L	11/07/1998	0.0005	keh	409	1207	SW 8310
Anthracene	<0.0005	mg/L	11/07/1998	0.0005	keh	409	1207	SW 8310
Benzo(a)anthracene	<0.00013	mg/L	11/07/1998	0.00013	keh	409	1207	SW 8310
Benzo(b)fluoranthene	<0.00018	mg/L	11/07/1998	0.00018	keh	409	1207	SW 8310
Benzo(k)fluoranthene	<0.00017	mg/L	11/07/1998	0.00017	keh	409	1207	SW 8310
Benzo(a)pyrene	<0.00023	mg/L	11/07/1998	0.00023	keh	409	1207	SW 8310
Benzo(ghi)perylene	<0.00076	mg/L	11/07/1998	0.00076	keh	409	1207	SW 8310
Chrysene	<0.0005	mg/L	11/07/1998	0.0005	keh	409	1207	SW 8310
Dibenzo(a,h)anthracene	<0.00030	mg/L	11/07/1998	0.00030	keh	409	1207	SW 8310
Fluoranthene	<0.0005	mg/L	11/07/1998	0.0005	keh	409	1207	SW 8310
Fluorene	<0.0005	mg/L	11/07/1998	0.0005	keh	409	1207	SW 8310
Indeno(1,2,3-cd)pyrene	<0.00043	mg/L	11/07/1998	0.00043	keh	409	1207	SW 8310
Naphthalene	0.00056	mg/L	11/07/1998	0.0005	keh	409	1207	SW 8310
Phenanthrene	<0.0010	mg/L	11/07/1998	0.0010	keh	409	1207	SW 8310
Pyrene	<0.0005	mg/L	11/07/1998	0.0005	keh	409	1207	SW 8310

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ANALYTICAL REPORT

Mr. Wei-Lin Feng
ENSR
740 Pasquinelli Drive
Westmont, IL 60559

11/10/1998

Sample No. : 500692

NET Job No.: 98.14078

Sample Description: MW-1
ComEd-Waukegan; 1801-023

Date Taken: 10/29/1998
Time Taken: 11:15
IEPA Cert. No. 100221

Date Received: 10/30/1998
Time Received: 12:45
WDNR Cert. No. 999447130

Parameter	Results	Units	Date of Analysis	Method PQL	Analyst	Batch No. Prep/Run	Analytical Method
Surr: p-Terphenyl	82.2	%	11/07/1998	43-125	keh	409 1207	SW 8310

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ANALYTICAL REPORT

Mr. Wei-Lin Feng
ENSR
740 Pasquinelli Drive
Westmont, IL 60559

11/10/1998

Sample No. : 500693

NET Job No.: 98.14078

Sample Description: MW-2
ComEd-Waukegan; 1801-023

Date Taken: 10/29/1998
Time Taken: 13:00
IEPA Cert. No. 100221

Date Received: 10/30/1998
Time Received: 12:45
WDNR Cert. No. 999447130

Parameter	Results	Units	Date of Analysis	Method PQL	Analyst	Batch No. Prep/Run	Analytical Method
pH	6.91	units	10/30/1998	0.10	efw	1719	EPA 150.1
Arsenic, GFAA	0.0073	mg/L	11/09/1998	0.0050	out	1358 1148	SW 7060
Barium, ICP	0.070	mg/L	11/05/1998	0.020	kdw	2201 3769	SW 6010B
Cadmium, ICP	<0.010	mg/L	11/05/1998	0.010	kdw	2201 3737	SW 6010B
Chromium, ICP	<0.040	mg/L	11/05/1998	0.040	kdw	2201 3746	SW 6010B
Lead, GFAA	<0.0050	mg/L	11/05/1998	0.0050	out	1358 2174	SW 7421
Mercury, CVAA	<0.0002	mg/L	11/05/1998	0.0002	sep	1187 1093	SW 7470A
Selenium, GFAA	<0.0050	mg/L	11/06/1998	0.0050	out	1358 859	SW 7740
Silver, AA	<0.040	mg/L	11/06/1998	0.040	sep	1016 995	SW 7760
Prep, PCBs 8082 Aqueous	COMPLETE		11/05/1998		wna	371	SW 3510C
PCBs 8082 Aqueous							
PCB-1016	<0.0005	mg/L	11/06/1998	0.0005	tls	371 703	SW 8082
PCB-1221	<0.0005	mg/L	11/06/1998	0.0005	tls	371 703	SW 8082
PCB-1232	<0.0005	mg/L	11/06/1998	0.0005	tls	371 703	SW 8082
PCB-1242	<0.0005	mg/L	11/06/1998	0.0005	tls	371 703	SW 8082
PCB-1248	<0.0005	mg/L	11/06/1998	0.0005	tls	371 703	SW 8082
PCB-1254	<0.0005	mg/L	11/06/1998	0.0005	tls	371 703	SW 8082
PCB-1260	<0.0005	mg/L	11/06/1998	0.0005	tls	371 703	SW 8082
Surr: Tetrachloroxylene (TCX)	79.0	%	11/06/1998	22-154	tls	371 703	SW 8082
Surr: Decachlorobiphenyl (DCB)	70.0	%	11/06/1998	23-154	tls	371 703	SW 8082

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ANALYTICAL REPORT

Mr. Wei-Lin Feng
ENSR
740 Pasquinelli Drive
Westmont, IL 60559

11/10/1998

Sample No. : 500693

NET Job No.: 98.14078

Sample Description: MW-2
ComEd-Waukegan; 1801-023

Date Taken: 10/29/1998
Time Taken: 13:00
IEPA Cert. No. 100221

Date Received: 10/30/1998
Time Received: 12:45
WDNR Cert. No. 999447130

Parameter	Results	Units	Date of Analysis	Method PQL	Analyst	Batch No. Prep/Run		Analytical Method
UST VOLATILES 8260 - AQUEOUS								
Benzene	<0.001	mg/L	11/07/1998	0.001	mjo		2642	SW 8260A
Ethyl Benzene	<0.001	mg/L	11/07/1998	0.001	mjo		2642	SW 8260A
Toluene	<0.001	mg/L	11/07/1998	0.001	mjo		2642	SW 8260A
Xylenes, Total	<0.001	mg/L	11/07/1998	0.001	mjo		2642	SW 8260A
Surr: Toluene-d8	105.4	%	11/07/1998	85-117	mjo		2642	SW 8260A
Surr: Bromofluorobenzene	103.0	%	11/07/1998	80-116	mjo		2642	SW 8260A
Surr: Dibromofluoromethane	100.0	%	11/07/1998	75-130	mjo		2642	SW 8260A
Prep, 8310 PNAs AQUEOUS	extracted		11/04/1998		mmv	409		SW 3520C
PNA CMPDS - 8310 AQUEOUS								
Acenaphthene	<0.0005	mg/L	11/07/1998	0.0005	keh	409	1207	SW 8310
Acenaphthylene	<0.0005	mg/L	11/07/1998	0.0005	keh	409	1207	SW 8310
Anthracene	<0.0005	mg/L	11/07/1998	0.0005	keh	409	1207	SW 8310
Benzo(a)anthracene	<0.00013	mg/L	11/07/1998	0.00013	keh	409	1207	SW 8310
Benzo(b)fluoranthene	<0.00018	mg/L	11/07/1998	0.00018	keh	409	1207	SW 8310
Benzo(k)fluoranthene	<0.00017	mg/L	11/07/1998	0.00017	keh	409	1207	SW 8310
Benzo(a)pyrene	<0.00023	mg/L	11/07/1998	0.00023	keh	409	1207	SW 8310
Benzo(ghi)perylene	<0.00076	mg/L	11/07/1998	0.00076	keh	409	1207	SW 8310
Chrysene	<0.0005	mg/L	11/07/1998	0.0005	keh	409	1207	SW 8310
Dibenzo(a,h)anthracene	<0.00030	mg/L	11/07/1998	0.00030	keh	409	1207	SW 8310
Fluoranthene	<0.0005	mg/L	11/07/1998	0.0005	keh	409	1207	SW 8310
Fluorene	<0.0005	mg/L	11/07/1998	0.0005	keh	409	1207	SW 8310
Indeno(1,2,3-cd)pyrene	<0.00043	mg/L	11/07/1998	0.00043	keh	409	1207	SW 8310
Naphthalene	0.00058	mg/L	11/07/1998	0.0005	keh	409	1207	SW 8310
Phenanthrene	<0.0010	mg/L	11/07/1998	0.0010	keh	409	1207	SW 8310
Pyrene	<0.0005	mg/L	11/07/1998	0.0005	keh	409	1207	SW 8310

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ANALYTICAL REPORT

Mr. Wei-Lin Feng
ENSR
740 Pasquinelli Drive
Westmont, IL 60559

11/10/1998

Sample No. : 500693

NET Job No.: 98.14078

Sample Description: MW-2
ComEd-Waukegan; 1801-023

Date Taken: 10/29/1998
Time Taken: 13:00
IEPA Cert. No. 100221

Date Received: 10/30/1998
Time Received: 12:45
WDNR Cert. No. 999447130

Parameter	Results	Units	Date of Analysis	Method PQL	Analyst	Batch No. Prep/Run	Analytical Method
Surr: p-Terphenyl	91.1	%	11/07/1998	43-125	keh	409 1207	SW 8310

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(800) 807-2877

ANALYTICAL REPORT

Mr. Wei-Lin Feng
ENSR
740 Pasquinelli Drive
Westmont, IL 60559

11/10/1998

Sample No. : 500694

NET Job No.: 98.14078

Sample Description: MW-3
ComEd-Waukegan; 1801-023

Date Taken: 10/29/1998
Time Taken: 10:30
IEPA Cert. No. 100221

Date Received: 10/30/1998
Time Received: 12:45
WDNR Cert. No. 999447130

Parameter	Results	Units	Date of Analysis	Method PQL	Analyst	Batch No. Prep/Run		Analytical Method
pH	6.74	units	10/30/1998	0.10	efw		1719	EPA 150.1
Arsenic, GFAA	<0.0050	mg/L	11/09/1998	0.0050	out	1358	1148	SW 7060
Barium, ICP	0.085	mg/L	11/05/1998	0.020	kdw	2201	3769	SW 6010B
Cadmium, ICP	<0.010	mg/L	11/05/1998	0.010	kdw	2201	3737	SW 6010B
Chromium, ICP	<0.040	mg/L	11/05/1998	0.040	kdw	2201	3746	SW 6010B
Lead, GFAA	<0.0050	mg/L	11/05/1998	0.0050	out	1358	2174	SW 7421
Mercury, CVAA	<0.0002	mg/L	11/05/1998	0.0002	sep	1187	1093	SW 7470A
Selenium, GFAA	<0.0050	mg/L	11/06/1998	0.0050	out	1358	859	SW 7740
Silver, AA	<0.040	mg/L	11/06/1998	0.040	sep	1016	995	SW 7760
Prep, PCBs 8082 Aqueous	COMPLETE		11/05/1998		wna	371		SW 3510C
PCBs 8082 Aqueous								
PCB-1016	<0.0005	mg/L	11/06/1998	0.0005	tls	371	703	SW 8082
PCB-1221	<0.0005	mg/L	11/06/1998	0.0005	tls	371	703	SW 8082
PCB-1232	<0.0005	mg/L	11/06/1998	0.0005	tls	371	703	SW 8082
PCB-1242	<0.0005	mg/L	11/06/1998	0.0005	tls	371	703	SW 8082
PCB-1248	<0.0005	mg/L	11/06/1998	0.0005	tls	371	703	SW 8082
PCB-1254	<0.0005	mg/L	11/06/1998	0.0005	tls	371	703	SW 8082
PCB-1260	<0.0005	mg/L	11/06/1998	0.0005	tls	371	703	SW 8082
Surr: Tetrachloroxylene (TCX)	83.0	%	11/06/1998	22-154	tls	371	703	SW 8082
Surr: Decachlorobiphenyl (DCB)	76.0	%	11/06/1998	23-154	tls	371	703	SW 8082

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ANALYTICAL REPORT

Mr. Wei-Lin Feng
ENSR
740 Pasquinelli Drive
Westmont, IL 60559

11/10/1998

Sample No. : 500694

NET Job No.: 98.14078

Sample Description: MW-3
ComEd-Waukegan; 1801-023

Date Taken: 10/29/1998
Time Taken: 10:30
IEPA Cert. No. 100221

Date Received: 10/30/1998
Time Received: 12:45
WDNR Cert. No. 999447130

Parameter	Results	Units	Date of Analysis	Method PQL	Analyst	Batch No. Prep/Run		Analytical Method
UST VOLATILES 8260 - AQUEOUS								
Benzene	<0.001	mg/L	11/07/1998	0.001	mjo		2642	SW 8260A
Ethyl Benzene	<0.001	mg/L	11/07/1998	0.001	mjo		2642	SW 8260A
Toluene	<0.001	mg/L	11/07/1998	0.001	mjo		2642	SW 8260A
Xylenes, Total	<0.001	mg/L	11/07/1998	0.001	mjo		2642	SW 8260A
Surr: Toluene-d8	111.6	%	11/07/1998	85-117	mjo		2642	SW 8260A
Surr: Bromofluorobenzene	102.0	%	11/07/1998	80-116	mjo		2642	SW 8260A
Surr: Dibromofluoromethane	99.6	%	11/07/1998	75-130	mjo		2642	SW 8260A
Prep, 8310 PNAs AQUEOUS	extracted		11/04/1998		mmv	409		SW 3520C
PNA CMPDS - 8310 AQUEOUS								
Acenaphthene	<0.0005	mg/L	11/07/1998	0.0005	keh	409	1207	SW 8310
Acenaphthylene	<0.0005	mg/L	11/07/1998	0.0005	keh	409	1207	SW 8310
Anthracene	<0.0005	mg/L	11/07/1998	0.0005	keh	409	1207	SW 8310
Benzo(a)anthracene	<0.00013	mg/L	11/07/1998	0.00013	keh	409	1207	SW 8310
Benzo(b)fluoranthene	<0.00018	mg/L	11/07/1998	0.00018	keh	409	1207	SW 8310
Benzo(k)fluoranthene	<0.00017	mg/L	11/07/1998	0.00017	keh	409	1207	SW 8310
Benzo(a)pyrene	<0.00023	mg/L	11/07/1998	0.00023	keh	409	1207	SW 8310
Benzo(ghi)perylene	<0.00076	mg/L	11/07/1998	0.00076	keh	409	1207	SW 8310
Chrysene	<0.0005	mg/L	11/07/1998	0.0005	keh	409	1207	SW 8310
Dibenzo(a,h)anthracene	<0.00030	mg/L	11/07/1998	0.00030	keh	409	1207	SW 8310
Fluoranthene	<0.0005	mg/L	11/07/1998	0.0005	keh	409	1207	SW 8310
Fluorene	<0.0005	mg/L	11/07/1998	0.0005	keh	409	1207	SW 8310
Indeno(1,2,3-cd)pyrene	<0.00043	mg/L	11/07/1998	0.00043	keh	409	1207	SW 8310
Naphthalene	0.0011	mg/L	11/07/1998	0.0005	keh	409	1207	SW 8310
Phenanthrene	<0.0010	mg/L	11/07/1998	0.0010	keh	409	1207	SW 8310
Pyrene	<0.0005	mg/L	11/07/1998	0.0005	keh	409	1207	SW 8310

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(800) 807-2877

ANALYTICAL REPORT

Mr. Wei-Lin Feng
ENSR
740 Pasquinelli Drive
Westmont, IL 60559

11/10/1998

Sample No. : 500694

NET Job No.: 98.14078

Sample Description: MW-3
ComEd-Waukegan; 1801-023

Date Taken: 10/29/1998
Time Taken: 10:30
IEPA Cert. No. 100221

Date Received: 10/30/1998
Time Received: 12:45
WDNR Cert. No. 999447130

Parameter	Results	Units	Date of Analysis	Method PQL	Analyst	Batch No. Prep/Run		Analytical Method
Surr: p-Terphenyl	84.2	%	11/07/1998	43-125	keh	409	1207	SW 8310

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ANALYTICAL REPORT

Mr. Wei-Lin Feng
ENSR
740 Pasquinelli Drive
Westmont, IL 60559

11/10/1998

Sample No. : 500695

NET Job No.: 98.14078

Sample Description: MW-4
ComEd-Waukegan; 1801-023

Date Taken: 10/29/1998
Time Taken: 14:00
IEPA Cert. No. 100221

Date Received: 10/30/1998
Time Received: 12:45
WDNR Cert. No. 999447130

Parameter	Results	Units	Date of Analysis	Method PQL	Analyst	Batch No. Prep/Run	Analytical Method
pH	6.52	units	10/30/1998	0.10	efw	1719	EPA 150.1
Arsenic, GFAA	<0.0050	mg/L	11/09/1998	0.0050	out	1358 1148	SW 7060
Barium, ICP	0.048	mg/L	11/05/1998	0.020	kdw	2201 3769	SW 6010B
Cadmium, ICP	<0.010	mg/L	11/05/1998	0.010	kdw	2201 3737	SW 6010B
Chromium, ICP	<0.040	mg/L	11/05/1998	0.040	kdw	2201 3746	SW 6010B
Lead, GFAA	<0.0050	mg/L	11/05/1998	0.0050	out	1358 2174	SW 7421
Mercury, CVAA	<0.0002	mg/L	11/05/1998	0.0002	sep	1187 1093	SW 7470A
Selenium, GFAA	<0.0050	mg/L	11/06/1998	0.0050	out	1358 859	SW 7740
Silver, AA	<0.040	mg/L	11/06/1998	0.040	sep	1016 995	SW 7760
Prep, PCBs 8082 Aqueous	COMPLETE		11/05/1998		wna	371	SW 3510C
PCBs 8082 Aqueous							
PCB-1016	<0.0005	mg/L	11/07/1998	0.0005	tls	371 703	SW 8082
PCB-1221	<0.0005	mg/L	11/07/1998	0.0005	tls	371 703	SW 8082
PCB-1232	<0.0005	mg/L	11/07/1998	0.0005	tls	371 703	SW 8082
PCB-1242	<0.0005	mg/L	11/07/1998	0.0005	tls	371 703	SW 8082
PCB-1248	<0.0005	mg/L	11/07/1998	0.0005	tls	371 703	SW 8082
PCB-1254	<0.0005	mg/L	11/07/1998	0.0005	tls	371 703	SW 8082
PCB-1260	<0.0005	mg/L	11/07/1998	0.0005	tls	371 703	SW 8082
Surr: Tetrachloroxylene (TCX)	83.0	%	11/07/1998	22-154	tls	371 703	SW 8082
Surr: Decachlorobiphenyl (DCB)	81.0	%	11/07/1998	23-154	tls	371 703	SW 8082

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ANALYTICAL REPORT

Mr. Wei-Lin Feng
ENSR
740 Pasquinelli Drive
Westmont, IL 60559

11/10/1998

Sample No. : 500695

NET Job No.: 98.14078

Sample Description: MW-4
ComEd-Waukegan; 1801-023

Date Taken: 10/29/1998
Time Taken: 14:00
IEPA Cert. No. 100221

Date Received: 10/30/1998
Time Received: 12:45
WDNR Cert. No. 999447130

Parameter	Results	Units	Date of Analysis	Method PQL	Analyst	Batch No. Prep/Run		Analytical Method
UST VOLATILES 8260 - AQUEOUS								
Benzene	<0.001	mg/L	11/07/1998	0.001	mjo		2642	SW 8260A
Ethyl Benzene	<0.001	mg/L	11/07/1998	0.001	mjo		2642	SW 8260A
Toluene	<0.001	mg/L	11/07/1998	0.001	mjo		2642	SW 8260A
Xylenes, Total	<0.001	mg/L	11/07/1998	0.001	mjo		2642	SW 8260A
Surr: Toluene-d8	111.4	%	11/07/1998	85-117	mjo		2642	SW 8260A
Surr: Bromofluorobenzene	102.0	%	11/07/1998	80-116	mjo		2642	SW 8260A
Surr: Dibromofluoromethane	99.2	%	11/07/1998	75-130	mjo		2642	SW 8260A
Prep, 8310 PNAs AQUEOUS	extracted		11/04/1998		mmv	409		SW 3520C
PNA CMPDS - 8310 AQUEOUS								
Acenaphthene	<0.0005	mg/L	11/07/1998	0.0005	keh	409	1207	SW 8310
Acenaphthylene	<0.0005	mg/L	11/07/1998	0.0005	keh	409	1207	SW 8310
Anthracene	<0.0005	mg/L	11/07/1998	0.0005	keh	409	1207	SW 8310
Benzo(a)anthracene	<0.00013	mg/L	11/07/1998	0.00013	keh	409	1207	SW 8310
Benzo(b)fluoranthene	<0.00018	mg/L	11/07/1998	0.00018	keh	409	1207	SW 8310
Benzo(k)fluoranthene	<0.00017	mg/L	11/07/1998	0.00017	keh	409	1207	SW 8310
Benzo(a)pyrene	<0.00023	mg/L	11/07/1998	0.00023	keh	409	1207	SW 8310
Benzo(ghi)perylene	<0.00076	mg/L	11/07/1998	0.00076	keh	409	1207	SW 8310
Chrysene	<0.0005	mg/L	11/07/1998	0.0005	keh	409	1207	SW 8310
Dibenzo(a,h)anthracene	<0.00030	mg/L	11/07/1998	0.00030	keh	409	1207	SW 8310
Fluoranthene	<0.0005	mg/L	11/07/1998	0.0005	keh	409	1207	SW 8310
Fluorene	<0.0005	mg/L	11/07/1998	0.0005	keh	409	1207	SW 8310
Indeno(1,2,3-cd)pyrene	<0.00043	mg/L	11/07/1998	0.00043	keh	409	1207	SW 8310
Naphthalene	0.00062	mg/L	11/07/1998	0.0005	keh	409	1207	SW 8310
Phenanthrene	<0.0010	mg/L	11/07/1998	0.0010	keh	409	1207	SW 8310
Pyrene	<0.0005	mg/L	11/07/1998	0.0005	keh	409	1207	SW 8310

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ANALYTICAL REPORT

Mr. Wei-Lin Feng
ENSR
740 Pasquinelli Drive
Westmont, IL 60559

11/10/1998

Sample No. : 500695

NET Job No.: 98.14078

Sample Description: MW-4
ComEd-Waukegan; 1801-023

Date Taken: 10/29/1998
Time Taken: 14:00
IEPA Cert. No. 100221

Date Received: 10/30/1998
Time Received: 12:45
WDNR Cert. No. 999447130

Parameter	Results	Units	Date of Analysis	Method PQL	Analyst	Batch No. Prep/Run	Analytical Method
Surr: p-Terphenyl	92.2	%	11/07/1998	43-125	keh	409 1207	SW 8310

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ANALYTICAL REPORT

Mr. Wei-Lin Feng
ENSR
740 Pasquinelli Drive
Westmont, IL 60559

11/10/1998

Sample No. : 500696

NET Job No.: 98.14078

Sample Description: MW-5
ComEd-Waukegan; 1801-023

Date Taken: 10/29/1998
Time Taken: 15:00
IEPA Cert. No. 100221

Date Received: 10/30/1998
Time Received: 12:45
WDNR Cert. No. 999447130

Parameter	Results	Units	Date of Analysis	Method PQL	Analyst	Batch No. Prep/Run	Analytical Method
pH	6.85	units	10/30/1998	0.10	efw	1719	EPA 150.1
Arsenic, GFAA	<0.0050	mg/L	11/09/1998	0.0050	out	1358 1148	SW 7060
Barium, ICP	0.104	mg/L	11/05/1998	0.020	kdw	2201 3769	SW 6010B
Cadmium, ICP	<0.010	mg/L	11/05/1998	0.010	kdw	2201 3737	SW 6010B
Chromium, ICP	<0.040	mg/L	11/05/1998	0.040	kdw	2201 3746	SW 6010B
Lead, GFAA	<0.0050	mg/L	11/05/1998	0.0050	out	1358 2174	SW 7421
Mercury, CVAA	<0.0002	mg/L	11/05/1998	0.0002	sep	1187 1093	SW 7470A
Selenium, GFAA	<0.0050	mg/L	11/06/1998	0.0050	out	1358 859	SW 7740
Silver, AA	<0.040	mg/L	11/06/1998	0.040	sep	1016 995	SW 7760
Prep, PCBs 8082 Aqueous	COMPLETE		11/05/1998		wna	371	SW 3510C
PCBs 8082 Aqueous							
PCB-1016	<0.0005	mg/L	11/07/1998	0.0005	tls	371 703	SW 8082
PCB-1221	<0.0005	mg/L	11/07/1998	0.0005	tls	371 703	SW 8082
PCB-1232	<0.0005	mg/L	11/07/1998	0.0005	tls	371 703	SW 8082
PCB-1242	<0.0005	mg/L	11/07/1998	0.0005	tls	371 703	SW 8082
PCB-1248	<0.0005	mg/L	11/07/1998	0.0005	tls	371 703	SW 8082
PCB-1254	<0.0005	mg/L	11/07/1998	0.0005	tls	371 703	SW 8082
PCB-1260	<0.0005	mg/L	11/07/1998	0.0005	tls	371 703	SW 8082
Surr: Tetrachloroxylene (TCX)	80.0	%	11/07/1998	22-154	tls	371 703	SW 8082
Surr: Decachlorobiphenyl (DCB)	70.0	%	11/07/1998	23-154	tls	371 703	SW 8082

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ANALYTICAL REPORT

Mr. Wei-Lin Feng
ENSR
740 Pasquinelli Drive
Westmont, IL 60559

11/10/1998

Sample No. : 500696

NET Job No.: 98.14078

Sample Description: MW-5
ComEd-Waukegan; 1801-023

Date Taken: 10/29/1998
Time Taken: 15:00
IEPA Cert. No. 100221

Date Received: 10/30/1998
Time Received: 12:45
WDNR Cert. No. 999447130

Parameter	Results	Units	Date of Analysis	Method PQL	Analyst	Batch No. Prep/Run		Analytical Method
UST VOLATILES 8260 - AQUEOUS								
Benzene	<0.001	mg/L	11/07/1998	0.001	mjo		2642	SW 8260A
Ethyl Benzene	<0.001	mg/L	11/07/1998	0.001	mjo		2642	SW 8260A
Toluene	<0.001	mg/L	11/07/1998	0.001	mjo		2642	SW 8260A
Xylenes, Total	<0.001	mg/L	11/07/1998	0.001	mjo		2642	SW 8260A
Surr: Toluene-d8	112.2	%	11/07/1998	85-117	mjo		2642	SW 8260A
Surr: Bromofluorobenzene	97.8	%	11/07/1998	80-116	mjo		2642	SW 8260A
Surr: Dibromofluoromethane	100.4	%	11/07/1998	75-130	mjo		2642	SW 8260A
Prep, 8310 PNAs AQUEOUS	extracted		11/04/1998		mmv	409		SW 3520C
PNA CMPDS - 8310 AQUEOUS								
Acenaphthene	<0.0005	mg/L	11/07/1998	0.0005	keh	409	1207	SW 8310
Acenaphthylene	<0.0005	mg/L	11/07/1998	0.0005	keh	409	1207	SW 8310
Anthracene	<0.0005	mg/L	11/07/1998	0.0005	keh	409	1207	SW 8310
Benzo(a)anthracene	<0.00013	mg/L	11/07/1998	0.00013	keh	409	1207	SW 8310
Benzo(b)fluoranthene	<0.00018	mg/L	11/07/1998	0.00018	keh	409	1207	SW 8310
Benzo(k)fluoranthene	<0.00017	mg/L	11/07/1998	0.00017	keh	409	1207	SW 8310
Benzo(a)pyrene	<0.00023	mg/L	11/07/1998	0.00023	keh	409	1207	SW 8310
Benzo(ghi)perylene	<0.00076	mg/L	11/07/1998	0.00076	keh	409	1207	SW 8310
Chrysene	<0.0005	mg/L	11/09/1998	0.0005	keh	409	1208	SW 8310
Dibenzo(a,h)anthracene	<0.00030	mg/L	11/07/1998	0.00030	keh	409	1207	SW 8310
Fluoranthene	<0.0005	mg/L	11/07/1998	0.0005	keh	409	1207	SW 8310
Fluorene	<0.0005	mg/L	11/07/1998	0.0005	keh	409	1207	SW 8310
Indeno(1,2,3-cd)pyrene	<0.00043	mg/L	11/07/1998	0.00043	keh	409	1207	SW 8310
Naphthalene	0.0012	mg/L	11/07/1998	0.0005	keh	409	1207	SW 8310
Phenanthrene	<0.0010	mg/L	11/07/1998	0.0010	keh	409	1207	SW 8310
Pyrene	<0.0005	mg/L	11/07/1998	0.0005	keh	409	1207	SW 8310

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ANALYTICAL REPORT

Mr. Wei-Lin Feng
ENSR
740 Pasquinelli Drive
Westmont, IL 60559

11/10/1998

Sample No. : 500696

NET Job No.: 98.14078

Sample Description: MW-5
ComEd-Waukegan; 1801-023

Date Taken: 10/29/1998
Time Taken: 15:00
IEPA Cert. No. 100221

Date Received: 10/30/1998
Time Received: 12:45
WDNR Cert. No. 999447130

Parameter	Results	Units	Date of Analysis	Method PQL	Analyst	Batch No. Prep/Run	Analytical Method
Surr: p-Terphenyl	78.7	%	11/07/1998	43-125	keh	409 1207	SW 8310

NATIONAL ENVIRONMENTAL TESTING, INC.

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ANALYTICAL REPORT

Mr. Wei-Lin Feng
ENSR
740 Pasquinelli Drive
Westmont, IL 60559

11/10/1998

Sample No. : 500697

NET Job No.: 98.14078

Sample Description: MW-6
ComEd-Waukegan; 1801-023

Date Taken: 10/29/1998
Time Taken: 15:45
IEPA Cert. No. 100221

Date Received: 10/30/1998
Time Received: 12:45
WDNR Cert. No. 999447130

Parameter	Results	Units	Date of Analysis	Method PQL	Analyst	Batch No. Prep/Run	Analytical Method
pH	7.06	units	10/30/1998	0.10	efw	1719	EPA 150.1
Arsenic, GFAA	0.010	mg/L	11/09/1998	0.0050	out	1358 1148	SW 7060
Barium, ICP	0.292	mg/L	11/05/1998	0.020	kdw	2201 3769	SW 6010B
Cadmium, ICP	<0.010	mg/L	11/05/1998	0.010	kdw	2201 3737	SW 6010B
Chromium, ICP	<0.040	mg/L	11/05/1998	0.040	kdw	2201 3746	SW 6010B
Lead, GFAA	<0.0050	mg/L	11/05/1998	0.0050	out	1358 2174	SW 7421
Mercury, CVAA	<0.0002	mg/L	11/05/1998	0.0002	sep	1187 1093	SW 7470A
Selenium, GFAA	<0.0050	mg/L	11/06/1998	0.0050	out	1358 859	SW 7740
Silver, AA	<0.040	mg/L	11/06/1998	0.040	sep	1016 995	SW 7760
Prep, PCBs 8082 Aqueous	COMPLETE		11/05/1998		wna	371	SW 3510C
PCBs 8082 Aqueous							
PCB-1016	<0.0005	mg/L	11/07/1998	0.0005	tls	371 703	SW 8082
PCB-1221	<0.0005	mg/L	11/07/1998	0.0005	tls	371 703	SW 8082
PCB-1232	<0.0005	mg/L	11/07/1998	0.0005	tls	371 703	SW 8082
PCB-1242	<0.0005	mg/L	11/07/1998	0.0005	tls	371 703	SW 8082
PCB-1248	<0.0005	mg/L	11/07/1998	0.0005	tls	371 703	SW 8082
PCB-1254	<0.0005	mg/L	11/07/1998	0.0005	tls	371 703	SW 8082
PCB-1260	<0.0005	mg/L	11/07/1998	0.0005	tls	371 703	SW 8082
Surr: Tetrachloroxylene (TCX)	87.0	%	11/07/1998	22-154	tls	371 703	SW 8082
Surr: Decachlorobiphenyl (DCB)	76.0	%	11/07/1998	23-154	tls	371 703	SW 8082

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ANALYTICAL REPORT

Mr. Wei-Lin Feng
ENSR
740 Pasquinelli Drive
Westmont, IL 60559

11/10/1998

Sample No. : 500697

NET Job No.: 98.14078

Sample Description: MW-6
ComEd-Waukegan; 1801-023

Date Taken: 10/29/1998
Time Taken: 15:45
IEPA Cert. No. 100221

Date Received: 10/30/1998
Time Received: 12:45
WDNR Cert. No. 999447130

Parameter	Results	Units	Date of Analysis	Method PQL	Analyst	Batch No. Prep/Run		Analytical Method
UST VOLATILES 8260 - AQUEOUS								
Benzene	<0.001	mg/L	11/07/1998	0.001	mjo		2642	SW 8260A
Ethyl Benzene	<0.001	mg/L	11/07/1998	0.001	mjo		2642	SW 8260A
Toluene	<0.001	mg/L	11/07/1998	0.001	mjo		2642	SW 8260A
Xylenes, Total	<0.001	mg/L	11/07/1998	0.001	mjo		2642	SW 8260A
Surr: Toluene-d8	105.0	%	11/07/1998	85-117	mjo		2642	SW 8260A
Surr: Bromofluorobenzene	101.6	%	11/07/1998	80-116	mjo		2642	SW 8260A
Surr: Dibromofluoromethane	98.4	%	11/07/1998	75-130	mjo		2642	SW 8260A
Prep, 8310 PNAs AQUEOUS	extracted		11/04/1998		mmv	409		SW 3520C
PNA CMPDS - 8310 AQUEOUS								
Acenaphthene	<0.0005	mg/L	11/07/1998	0.0005	keh	409	1207	SW 8310
Acenaphthylene	<0.0005	mg/L	11/07/1998	0.0005	keh	409	1207	SW 8310
Anthracene	<0.0005	mg/L	11/07/1998	0.0005	keh	409	1207	SW 8310
Benzo(a)anthracene	<0.00013	mg/L	11/07/1998	0.00013	keh	409	1207	SW 8310
Benzo(b)fluoranthene	<0.00018	mg/L	11/07/1998	0.00018	keh	409	1207	SW 8310
Benzo(k)fluoranthene	<0.00017	mg/L	11/07/1998	0.00017	keh	409	1207	SW 8310
Benzo(a)pyrene	<0.00023	mg/L	11/07/1998	0.00023	keh	409	1207	SW 8310
Benzo(ghi)perylene	<0.00076	mg/L	11/07/1998	0.00076	keh	409	1207	SW 8310
Chrysene	<0.0005	mg/L	11/07/1998	0.0005	keh	409	1207	SW 8310
Dibenzo(a,h)anthracene	<0.00030	mg/L	11/07/1998	0.00030	keh	409	1207	SW 8310
Fluoranthene	<0.0005	mg/L	11/07/1998	0.0005	keh	409	1207	SW 8310
Fluorene	<0.0005	mg/L	11/07/1998	0.0005	keh	409	1207	SW 8310
Indeno(1,2,3-cd)pyrene	<0.00043	mg/L	11/07/1998	0.00043	keh	409	1207	SW 8310
Naphthalene	<0.0005	mg/L	11/07/1998	0.0005	keh	409	1207	SW 8310
Phenanthrene	<0.0010	mg/L	11/07/1998	0.0010	keh	409	1207	SW 8310
Pyrene	<0.0005	mg/L	11/07/1998	0.0005	keh	409	1207	SW 8310

NATIONAL ENVIRONMENTAL TESTING, INC.

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ANALYTICAL REPORT

Mr. Wei-Lin Feng
ENSR
740 Pasquinelli Drive
Westmont, IL 60559

11/10/1998

Sample No. : 500697

NET Job No.: 98.14078

Sample Description: MW-6
ComEd-Waukegan; 1801-023

Date Taken: 10/29/1998
Time Taken: 15:45
IEPA Cert. No. 100221

Date Received: 10/30/1998
Time Received: 12:45
WDNR Cert. No. 999447130

Parameter	Results	Units	Date of Analysis	Method PQL	Analyst	Batch No. Prep/Run	Analytical Method
Surr: p-Terphenyl	84.0	%	11/07/1998	43-125	keh	409 1207	SW 8310

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ANALYTICAL REPORT

Mr. Wei-Lin Feng
ENSR
740 Pasquinelli Drive
Westmont, IL 60559

11/10/1998

Sample No. : 500698

NET Job No.: 98.14078

Sample Description: MW-7
ComEd-Waukegan; 1801-023

Date Taken: 10/29/1998
Time Taken: 09:30
IEPA Cert. No. 100221

Date Received: 10/30/1998
Time Received: 12:45
WDNR Cert. No. 999447130

Parameter	Results	Units	Date of Analysis	Method PQL	Analyst	Batch No. Prep/Run	Analytical Method
pH	7.44	units	10/30/1998	0.10	efw	1719	EPA 150.1
Arsenic, GFAA	0.0072	mg/L	11/09/1998	0.0050	out	1358 1148	SW 7060
Barium, ICP	0.151	mg/L	11/06/1998	0.020	jtt	2205 3774	SW 6010B
Cadmium, ICP	<0.010	mg/L	11/06/1998	0.010	jtt	2205 3741	SW 6010B
Chromium, ICP	<0.040	mg/L	11/06/1998	0.040	jtt	2205 3752	SW 6010B
Lead, GFAA	<0.0050	mg/L	11/05/1998	0.0050	out	1358 2174	SW 7421
Mercury, CVAA	<0.0002	mg/L	11/09/1998	0.0002	sep	1189 1095	SW 7470A
Selenium, GFAA	<0.0050	mg/L	11/06/1998	0.0050	out	1358 859	SW 7740
Silver, AA	<0.040	mg/L	11/06/1998	0.040	sep	1017 995	SW 7760
Prep, PCBs 8082 Aqueous	COMPLETE		11/05/1998		wna	371	SW 3510C
PCBs 8082 Aqueous							
PCB-1016	<0.0005	mg/L	11/07/1998	0.0005	tls	371 703	SW 8082
PCB-1221	<0.0005	mg/L	11/07/1998	0.0005	tls	371 703	SW 8082
PCB-1232	<0.0005	mg/L	11/07/1998	0.0005	tls	371 703	SW 8082
PCB-1242	<0.0005	mg/L	11/07/1998	0.0005	tls	371 703	SW 8082
PCB-1248	<0.0005	mg/L	11/07/1998	0.0005	tls	371 703	SW 8082
PCB-1254	<0.0005	mg/L	11/07/1998	0.0005	tls	371 703	SW 8082
PCB-1260	<0.0005	mg/L	11/07/1998	0.0005	tls	371 703	SW 8082
Surr: Tetrachloroxylene (TCX)	69.0	%	11/07/1998	22-154	tls	371 703	SW 8082
Surr: Decachlorobiphenyl (DCB)	67.0	%	11/07/1998	23-154	tls	371 703	SW 8082

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ANALYTICAL REPORT

Mr. Wei-Lin Feng
ENSR
740 Pasquinelli Drive
Westmont, IL 60559

11/10/1998

Sample No. : 500698

NET Job No.: 98.14078

Sample Description: MW-7
ComEd-Waukegan; 1801-023

Date Taken: 10/29/1998
Time Taken: 09:30
IEPA Cert. No. 100221

Date Received: 10/30/1998
Time Received: 12:45
WDNR Cert. No. 999447130

Parameter	Results	Units	Date of Analysis	Method PQL	Analyst	Batch No. Prep/Run		Analytical Method
UST VOLATILES 8260 - AQUEOUS								
Benzene	0.0048	mg/L	11/07/1998	0.001	mjo		2642	SW 8260A
Ethyl Benzene	<0.001	mg/L	11/07/1998	0.001	mjo		2642	SW 8260A
Toluene	<0.001	mg/L	11/07/1998	0.001	mjo		2642	SW 8260A
Xylenes, Total	<0.001	mg/L	11/07/1998	0.001	mjo		2642	SW 8260A
Surr: Toluene-d8	105.6	%	11/07/1998	85-117	mjo		2642	SW 8260A
Surr: Bromofluorobenzene	102.6	%	11/07/1998	80-116	mjo		2642	SW 8260A
Surr: Dibromofluoromethane	98.6	%	11/07/1998	75-130	mjo		2642	SW 8260A
Prep, 8310 PNAs AQUEOUS	extracted		11/04/1998		mmv	409		SW 3520C
PNA CMPDS - 8310 AQUEOUS								
Acenaphthene	<0.0005	mg/L	11/07/1998	0.0005	keh	409	1207	SW 8310
Acenaphthylene	<0.0005	mg/L	11/07/1998	0.0005	keh	409	1207	SW 8310
Anthracene	<0.0005	mg/L	11/07/1998	0.0005	keh	409	1207	SW 8310
Benzo(a)anthracene	<0.00013	mg/L	11/07/1998	0.00013	keh	409	1207	SW 8310
Benzo(b)fluoranthene	<0.00018	mg/L	11/07/1998	0.00018	keh	409	1207	SW 8310
Benzo(k)fluoranthene	<0.00017	mg/L	11/07/1998	0.00017	keh	409	1207	SW 8310
Benzo(a)pyrene	<0.00023	mg/L	11/07/1998	0.00023	keh	409	1207	SW 8310
Benzo(ghi)perylene	<0.00076	mg/L	11/07/1998	0.00076	keh	409	1207	SW 8310
Chrysene	<0.0005	mg/L	11/07/1998	0.0005	keh	409	1207	SW 8310
Dibenzo(a,h)anthracene	<0.00030	mg/L	11/07/1998	0.00030	keh	409	1207	SW 8310
Fluoranthene	<0.0005	mg/L	11/07/1998	0.0005	keh	409	1207	SW 8310
Fluorene	<0.0005	mg/L	11/07/1998	0.0005	keh	409	1207	SW 8310
Indeno(1,2,3-cd)pyrene	<0.00043	mg/L	11/07/1998	0.00043	keh	409	1207	SW 8310
Naphthalene	<0.0005	mg/L	11/07/1998	0.0005	keh	409	1207	SW 8310
Phenanthrene	<0.0010	mg/L	11/07/1998	0.0010	keh	409	1207	SW 8310
Pyrene	<0.0005	mg/L	11/07/1998	0.0005	keh	409	1207	SW 8310

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ANALYTICAL REPORT

Mr. Wei-Lin Feng
ENSR
740 Pasquinelli Drive
Westmont, IL 60559

11/10/1998

Sample No. : 500698

NET Job No.: 98.14078

Sample Description: MW-7
ComEd-Waukegan; 1801-023

Date Taken: 10/29/1998
Time Taken: 09:30
IEPA Cert. No. 100221

Date Received: 10/30/1998
Time Received: 12:45
WDNR Cert. No. 999447130

Parameter	Results	Units	Date of Analysis	Method PQL	Analyst	Batch No. Prep/Run	Analytical Method
Surr: p-Terphenyl	90.2	%	11/07/1998	43-125	keh	409 1207	SW 8310

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QUALITY CONTROL REPORT

CONTINUING CALIBRATION VERIFICATION

ENSR
740 Pasquinelli Drive
Westmont, IL 60559

11/10/1998

NET Job Number: 98.14078

Mr. Wei-Lin Feng

Analyte	Run Batch Number	CCV True Conc.	Conc. Found	Percent Recovery
pH	1719	7.02	7.00	99.7
Arsenic, GFAA	1148	0.0500	0.0508	101.6
Arsenic, GFAA	1148	0.0500	0.0536	107.2
Barium, ICP	3769	2.00	1.98	99.0
Barium, ICP	3774	2.00	2.09	104.5
Cadmium, ICP	3737	1.00	0.969	96.9
Cadmium, ICP	3741	1.00	1.02	102.0
Chromium, ICP	3746	2.00	1.97	98.5
Chromium, ICP	3752	2.00	2.09	104.5
Lead, GFAA	2174	0.0250	0.0256	102.4
Lead, GFAA	2174	0.0250	0.0261	104.4
Mercury, CVAA	1093	0.0025	0.00259	103.6
Mercury, CVAA	1093	0.0025	0.00259	103.6
Mercury, CVAA	1095	0.0025	0.00237	94.8
Selenium, GFAA	859	0.0500	0.0513	102.6
Selenium, GFAA	859	0.0500	0.0530	106.0
Silver, AA	995	0.500	0.504	100.8
PCBs 8082 Aqueous				
PCB-1016	703	500.	485	97.0
PCB-1260	703	500	500	100.0
PCBs 8082 Aqueous				
PCB-1016	703	500.	479	95.8
PCB-1260	703	500	499	99.8
PCBs 8082 Aqueous				
PCB-1016	703	500.	494	98.8
PCB-1260	703	500	436	87.2
PCBs 8082 Aqueous				
PCB-1016	703	500.	505	101.0
PCB-1260	703	500	531	106.2
PCBs 8082 Aqueous				
PCB-1016	703	500.	505	101.0
PCB-1260	703	500	505	101.0
UST VOLATILES 8260 - AQUEOUS				
Benzene	2642	50.0	52.7	105.4

CCV - Continuing Calibration Verification

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QUALITY CONTROL REPORT

CONTINUING CALIBRATION VERIFICATION

ENSR
740 Pasquinelli Drive
Westmont, IL 60559

11/10/1998

NET Job Number: 98.14078

Mr. Wei-Lin Feng

Analyte	Run Batch Number	CCV True Conc.	Conc. Found	Percent Recovery
Ethyl Benzene	2642	50.0	49.7	99.4
Toluene	2642	50.0	52.4	104.8
Xylenes, Total	2642	150	160	106.7
PNA CMPDS - 8310 AQUEOUS				
Acenaphthene	1207	5000	4,792	95.8
Acenaphthylene	1207	5000	5,040	100.8
Anthracene	1207	5000	5,183	103.7
Benzo(a)anthracene	1207	5000	5,118	102.4
Benzo(b)fluoranthene	1207	5000	4,872	97.4
Benzo(k)fluoranthene	1207	5000	4,870	97.4
Benzo(a)pyrene	1207	5000	4,920	98.4
Benzo(ghi)perylene	1207	5000	5,057	101.1
Chrysene	1207	5000	5,092	101.8
Dibenzo(a,h)anthracene	1207	5000	4,995	99.9
Fluoranthene	1207	5000	5,169	103.4
Fluorene	1207	5000	5,000	100.0
Indeno(1,2,3-cd)pyrene	1207	5000	5,131	102.6
Naphthalene	1207	5000	4,753	95.1
Phenanthrene	1207	5000	5,074	101.5
Pyrene	1207	5000	5,056	101.1
Surr: p-Terphenyl	1207	5000	4,919	98.4
PNA CMPDS - 8310 AQUEOUS				
Acenaphthene	1207	5000	4,808	96.2
Acenaphthylene	1207	5000	5,094	101.9
Anthracene	1207	5000	5,118	102.4
Benzo(a)anthracene	1207	5000	5,155	103.1
Benzo(b)fluoranthene	1207	5000	4,881	97.6
Benzo(k)fluoranthene	1207	5000	5,079	101.6
Benzo(a)pyrene	1207	5000	4,873	97.5
Benzo(ghi)perylene	1207	5000	5,112	102.2
Chrysene	1207	5000	5,105	102.1
Dibenzo(a,h)anthracene	1207	5000	4,988	99.8
Fluoranthene	1207	5000	5,046	100.9
Fluorene	1207	5000	4,960	99.2

CCV - Continuing Calibration Verification

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QUALITY CONTROL REPORT

CONTINUING CALIBRATION VERIFICATION

ENSR
740 Pasquinelli Drive
Westmont, IL 60559

11/10/1998

NET Job Number: 98.14078

Mr. Wei-Lin Feng

Analyte	Run Batch Number	CCV True Conc.	Conc. Found	Percent Recovery
Indeno(1,2,3-cd)pyrene	1207	5000	5,068	101.4
Naphthalene	1207	5000	4,798	96.0
Phenanthrene	1207	5000	5,130	102.6
Pyrene	1207	5000	4,954	99.1
Surr: p-Terphenyl	1207	5000	4,949	99.0
PNA CMPDS - 8310 AQUEOUS				
Acenaphthene	1207	5000	4,856	97.1
Acenaphthylene	1207	5000	4,994	99.9
Anthracene	1207	5000	5,106	102.1
Benzo(a)anthracene	1207	5000	5,117	102.3
Benzo(b)fluoranthene	1207	5000	4,842	96.8
Benzo(k)fluoranthene	1207	5000	4,932	98.6
Benzo(a)pyrene	1207	5000	4,832	96.6
Benzo(ghi)perylene	1207	5000	5,104	102.1
Chrysene	1207	5000	5,096	101.9
Dibenzo(a,h)anthracene	1207	5000	4,966	99.3
Fluoranthene	1207	5000	5,044	100.9
Fluorene	1207	5000	4,953	99.1
Indeno(1,2,3-cd)pyrene	1207	5000	4,980	99.6
Naphthalene	1207	5000	4,701	94.0
Phenanthrene	1207	5000	5,055	101.1
Pyrene	1207	5000	4,914	98.3
Surr: p-Terphenyl	1207	5000	5,009	100.2
PNA CMPDS - 8310 AQUEOUS				
Chrysene	1208	5000	5,078	101.6
PNA CMPDS - 8310 AQUEOUS				
Chrysene	1208	5000	5,175	103.5

CCV - Continuing Calibration Verification

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QUALITY CONTROL REPORT

BLANK ANALYSIS

ENSR
740 Pasquinelli Drive
Westmont, IL 60559

11/10/1998

NET Job Number: 98.14078

Mr. Wei-Lin Feng

Analyte	Prep Batch Number	Run Batch Number	Blank Analysis Results	Units	Reporting Limit	Analytical Method
Arsenic, GFAA		1148	<0.0050	mg/L	0.0050	SW 7060
Arsenic, GFAA		1148	<0.0050	mg/L	0.0050	SW 7060
Barium, ICP	2201	3769	<0.020	mg/L	0.020	SW 6010B
Barium, ICP	2205	3774	<0.020	mg/L	0.020	SW 6010B
Cadmium, ICP	2201	3737	<0.010	mg/L	0.010	SW 6010B
Cadmium, ICP	2205	3741	<0.010	mg/L	0.010	SW 6010B
Chromium, ICP	2201	3746	<0.040	mg/L	0.040	SW 6010B
Chromium, ICP	2205	3752	<0.040	mg/L	0.040	SW 6010B
Lead, GFAA		2174	<0.0050	mg/L	0.0050	SW 7421
Lead, GFAA		2174	<0.0050	mg/L	0.0050	SW 7421
Mercury, CVAA	1187	1093	<0.0002	mg/L	0.0002	SW 7470A
Mercury, CVAA	1187	1093	<0.0002	mg/L	0.0002	SW 7470A
Mercury, CVAA	1189	1095	<0.0002	mg/L	0.0002	SW 7470A
Mercury, CVAA	1189	1095	<0.0002	mg/L	0.0002	SW 7470A
Selenium, GFAA		859	<0.005	mg/L	0.005	SW 7740
Selenium, GFAA		859	<0.005	mg/L	0.005	SW 7740
Silver, AA	1016	995	<0.040	mg/L	0.040	SW 7760
Silver, AA	1017	995	<0.040	mg/L	0.040	SW 7760
PCBs 8082 Aqueous						SW 8082
PCB-1016	371	703	<0.0005	mg/L	0.5	SW 8082
PCB-1221	371	703	<0.0005	mg/L	0.5	SW 8082
PCB-1232	371	703	<0.0005	mg/L	0.5	SW 8082
PCB-1242	371	703	<0.0005	mg/L	0.5	SW 8082
PCB-1248	371	703	<0.0005	mg/L	0.5	SW 8082
PCB-1254	371	703	<0.0005	mg/L	0.5	SW 8082
PCB-1260	371	703	<0.0005	mg/L	0.5	SW 8082
Surr: Tetrachloroxylene (TCX)	371	703	50.0	%	22-154	SW 8082
Surr: Decachlorobiphenyl (DCB)	371	703	53.0	%	23-154	SW 8082
UST VOLATILES 8260 - AQUEOUS						SW 8260A

Advisory Control Limits for Blanks:

All compounds should be less than the Reporting Limit, except for phthalate esters, toluene, methylene chloride, acetone and chloroform should be less than 5 times the Reporting Limit.

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QUALITY CONTROL REPORT

BLANK ANALYSIS

ENSR
740 Pasquinelli Drive
Westmont, IL 60559

Mr. Wei-Lin Feng

11/10/1998

NET Job Number: 98.14078

Analyte	Prep Batch Number	Run Batch Number	Blank Analysis Results	Units	Reporting Limit	Analytical Method
Benzene		2642	<1.0	ug/L	1.0	SW 8260A
Ethyl Benzene		2642	<1.0	ug/L	1.0	SW 8260A
Toluene		2642	<1.0	ug/L	1.0	SW 8260A
Xylenes, Total		2642	<1.0	ug/L	1.0	SW 8260A
Surr: Dibromofluoromethane		2642	99.8	%	75-130	SW 8260A
Surr: Toluene-d8		2642	104.2	%	85-117	SW 8260A
Surr: Bromofluorobenzene		2642	102.2	%	80-116	SW 8260A
PNA CMPDS - 8310 AQUEOUS						SW 8310
Acenaphthene	409	1206	<0.0005	mg/L	0.0005	SW 8310
Acenaphthylene	409	1206	<0.0005	mg/L	0.0005	SW 8310
Anthracene	409	1206	<0.0005	mg/L	0.0005	SW 8310
Benzo(a)anthracene	409	1206	<0.00013	mg/L	0.00013	SW 8310
Benzo(b)fluoranthene	409	1206	<0.00018	mg/L	0.00018	SW 8310
Benzo(k)fluoranthene	409	1206	<0.00017	mg/L	0.00017	SW 8310
Benzo(a)pyrene	409	1206	<0.00023	mg/L	0.00023	SW 8310
Benzo(ghi)perylene	409	1206	<0.00076	mg/L	0.00076	SW 8310
Chrysene	409	1206	<0.0005	mg/L	0.0005	SW 8310
Dibenzo(a,h)anthracene	409	1206	<0.00030	mg/L	0.00030	SW 8310
Fluoranthene	409	1206	<0.0005	mg/L	0.0005	SW 8310
Fluorene	409	1206	<0.0005	mg/L	0.0005	SW 8310
Indeno(1,2,3-cd)pyrene	409	1206	<0.00043	mg/L	0.00043	SW 8310
Naphthalene	409	1206	<0.0005	mg/L	0.0005	SW 8310
Phenanthrene	409	1206	<0.0010	mg/L	0.0010	SW 8310
Pyrene	409	1206	<0.0005	mg/L	0.0005	SW 8310
Surr: p-Terphenyl	409	1206	92.3	%	43-125	SW 8310
PNA CMPDS - 8310 AQUEOUS						SW 8310
Acenaphthene	409	1207	<0.0005	mg/L	0.0005	SW 8310
Acenaphthylene	409	1207	<0.0005	mg/L	0.0005	SW 8310
Anthracene	409	1207	<0.0005	mg/L	0.0005	SW 8310

Advisory Control Limits for Blanks:

All compounds should be less than the Reporting Limit, except for phthalate esters, toluene, methylene chloride, acetone and chloroform should be less than 5 times the Reporting Limit.

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QUALITY CONTROL REPORT

BLANK ANALYSIS

ENSR
740 Pasquinelli Drive
Westmont, IL 60559

11/10/1998

NET Job Number: 98.14078

Mr. Wei-Lin Feng

Analyte	Prep Batch Number	Run Batch Number	Blank Analysis Results	Units	Reporting Limit	Analytical Method
Benzo(a)anthracene	409	1207	<0.00013	mg/L	0.00013	SW 8310
Benzo(b)fluoranthene	409	1207	<0.00018	mg/L	0.00018	SW 8310
Benzo(k)fluoranthene	409	1207	<0.00017	mg/L	0.00017	SW 8310
Benzo(a)pyrene	409	1207	<0.00023	mg/L	0.00023	SW 8310
Benzo(ghi)perylene	409	1207	<0.00076	mg/L	0.00076	SW 8310
Chrysene	409	1207	<0.0005	mg/L	0.0005	SW 8310
Dibenzo(a,h)anthracene	409	1207	<0.00030	mg/L	0.00030	SW 8310
Fluoranthene	409	1207	<0.0005	mg/L	0.0005	SW 8310
Fluorene	409	1207	<0.0005	mg/L	0.0005	SW 8310
Indeno(1,2,3-cd)pyrene	409	1207	<0.00043	mg/L	0.00043	SW 8310
Naphthalene	409	1207	<0.0005	mg/L	0.0005	SW 8310
Phenanthrene	409	1207	<0.0010	mg/L	0.0010	SW 8310
Pyrene	409	1207	<0.0005	mg/L	0.0005	SW 8310
Surr: p-Terphenyl	409	1207	90.8	%	43-125	SW 8310

Advisory Control Limits for Blanks:

All compounds should be less than the Reporting Limit, except for phthalate esters, toluene, methylene chloride, acetone and chloroform should be less than 5 times the Reporting Limit.

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QUALITY CONTROL REPORT

LABORATORY CONTROL STANDARD

ENSR
740 Pasquinelli Drive
Westmont, IL 60559

11/10/1998

NET Job Number: 98.14078

Mr. Wei-Lin Feng

Analyte	Prep Batch Number	Run Batch Number	True Conc.	Conc. Found	LCS % Recovery
Arsenic, GFAA		1148	0.0500	0.0544	108.8
Barium, ICP	2201	3769	5.00	5.44	108.8
Barium, ICP	2205	3774	0.200	0.198	99.0
Cadmium, ICP	2201	3737	2.50	2.57	102.8
Cadmium, ICP	2205	3741	0.100	0.094	94.0
Chromium, ICP	2201	3746	5.00	5.53	110.6
Chromium, ICP	2205	3752	0.20	0.198	99.0
Lead, GFAA		2174	0.0200	0.0214	107.0
Mercury, CVAA	1187	1093	0.0025	0.00253	101.2
Mercury, CVAA	1187	1093	0.0025	0.00253	101.2
Mercury, CVAA		1093	0.0020	0.00203	101.5
Mercury, CVAA	1189	1095	0.0025	0.00260	104.0
Mercury, CVAA	1189	1095	0.0025	0.00260	104.0
Mercury, CVAA		1095	0.0020	0.00214	107.0
Selenium, GFAA		859	0.0500	0.0586	117.2
Silver, AA	1016	995	0.10	0.091	91.0
Silver, AA	1017	995	0.10	0.095	95.0
PCBs 8082 Aqueous					
PCB-1016	371	703	500	449	89.8
PCB-1260	371	703	500	427	85.4
Surr: Tetrachloroxylene (TCX)	371	703	100	45	45.0
Surr: Decachlorobiphenyl (DCB)	371	703	100	64	64.0
UST VOLATILES 8260 - AQUEOUS					
Benzene		2642	20.0	22.6	113.0
Ethyl Benzene		2642	20.0	21.4	107.0
Toluene		2642	20.0	22.9	114.5
Xylenes, Total		2642	60.0	68.0	113.3
Surr: Dibromofluoromethane		2642	50.0	50.4	100.8
Surr: Toluene-d8		2642	50.0	56.0	112.0
Surr: Bromofluorobenzene		2642	50.0	53.6	107.2
PNA CMPDS - 8310 AQUEOUS					

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QUALITY CONTROL REPORT

LABORATORY CONTROL STANDARD

ENSR
740 Pasquinelli Drive
Westmont, IL 60559

11/10/1998

NET Job Number: 98.14078

Mr. Wei-Lin Feng

Analyte	Prep Batch Number	Run Batch Number	True Conc.	Conc. Found	LCS % Recovery
Acenaphthene	409	1206	0.001	0.000870	87.0
Acenaphthylene	409	1206	0.001	0.000962	96.2
Anthracene	409	1206	0.001	0.000945	94.5
Benzo(a)anthracene	409	1206	0.001	0.000946	94.6
Benzo(b)fluoranthene	409	1206	0.001	0.000867	86.7
Benzo(k)fluoranthene	409	1206	0.001	0.000909	90.9
Benzo(a)pyrene	409	1206	0.001	0.000865	86.5
Benzo(ghi)perylene	409	1206	0.001	0.000985	98.5
Chrysene	409	1206	0.001	0.000955	95.5
Dibenzo(a,h)anthracene	409	1206	0.001	0.000936	93.6
Fluoranthene	409	1206	0.001	0.000970	97.0
Fluorene	409	1206	0.001	0.000938	93.8
Indeno(1,2,3-cd)pyrene	409	1206	0.001	0.000858	85.8
Naphthalene	409	1206	0.001	0.000955	95.5
Phenanthrene	409	1206	0.001	0.000854	85.4
Pyrene	409	1206	0.001	0.000958	95.8
Surr: p-Terphenyl	409	1206	2000	1,797	89.8
PNA CMPDS - 8310 AQUEOUS					
Acenaphthene	409	1207	0.001	0.000926	92.6
Acenaphthylene	409	1207	0.001	0.000976	97.6
Anthracene	409	1207	0.001	0.00102	102.0
Benzo(a)anthracene	409	1207	0.001	0.00103	103.0
Benzo(b)fluoranthene	409	1207	0.001	0.000964	96.4
Benzo(k)fluoranthene	409	1207	0.001	0.000964	96.4
Benzo(a)pyrene	409	1207	0.001	0.000903	90.3
Benzo(ghi)perylene	409	1207	0.001	0.000991	99.1
Chrysene	409	1207	0.001	0.00101	101.0
Dibenzo(a,h)anthracene	409	1207	0.001	0.000972	97.2
Fluoranthene	409	1207	0.001	0.000998	99.8
Fluorene	409	1207	0.001	0.000980	98.0
Indeno(1,2,3-cd)pyrene	409	1207	0.001	0.00104	104.0

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QUALITY CONTROL REPORT

LABORATORY CONTROL STANDARD

ENSR
740 Pasquinelli Drive
Westmont, IL 60559

11/10/1998

NET Job Number: 98.14078

Mr. Wei-Lin Feng

Analyte	Prep Batch Number	Run Batch Number	True Conc.	Conc. Found	LCS % Recovery
Naphthalene	409	1207	0.001	0.000902	90.2
Phenanthrene	409	1207	0.001	0.0010	100.0
Pyrene	409	1207	0.001	0.000973	97.3
Surr: p-Terphenyl	409	1207	2000	1,922	96.1

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QUALITY CONTROL REPORT

DUPLICATES

ENSR
740 Pasquinelli Drive
Westmont, IL 60559

Mr. Wei-Lin Feng

11/10/1998

NET Job Number: 98.14078

Analyte	Prep Batch Number	Run Batch Number	Original Analysis	Duplicate Analysis	Units	RPD
pH		1719	4.91	4.82	units	1.8
pH		1719	6.91	6.86	units	0.7

NOTE: Spikes and Duplicates may not be samples from this job.

RPD - Relative Percent Difference

Advisory Control Limits for Duplicates - RPD should be less than 20.

NET Midwest, Bartlett Division

KEY TO ABBREVIATIONS and METHOD REFERENCES

<	:	Less than; When appearing in the results column indicates the analyte was not detected at or above the reported value.
mg/L	:	Concentration in units of milligrams of analyte per liter of sample. Measurement used for aqueous samples. Can also be expressed as parts per million (ppm).
ug/g	:	Concentration in units of micrograms of analyte per gram of sample. Measurement used for non-aqueous samples. Can also be expressed as parts per million (ppm) or mg/Kg.
ug/L	:	Concentration in units of micrograms of analyte per liter of sample. Measurement used for aqueous samples. Can also be expressed as parts per billion (ppb).
ug/Kg	:	Concentration in units of micrograms of analyte per kilogram of sample. Measurement used for non-aqueous samples. Can also be expressed as parts per billion (ppb).
TCLP	:	These initials appearing in front of an analyte name indicate that the Toxicity Characteristic Leaching Procedure (TCLP) was performed for this test.
Surr:	:	These initials are the abbreviation for surrogate. Surrogates are compounds that are chemically similar to the compounds of interest. They are part of the method quality control requirements.
%	:	Percent; To convert ppm to %, divide the result by 10,000. To convert % to ppm, multiply the result by 10,000.
ICP	:	Indicates analysis was performed using Inductively Coupled Plasma Spectroscopy.
AA	:	Indicates analysis was performed using Atomic Absorption Spectroscopy.
GFAA	:	Indicates analysis was performed using Graphite Furnace Atomic Absorption Spectroscopy.
PQL	:	Practical Quantitation Limit; the lowest level that can be reliably achieved within specified limits of precision and accuracy during routine laboratory operating conditions.

Method References

(1) Methods 1000 through 9999: see "Test Methods for Evaluating Solid Waste", USEPA SW-846, 3rd Edition, 1986.

(2) ASTM "American Society for Testing Materials"

(3) Methods 100 through 499: see "Methods for Chemical Analysis of Water and Wastes", USEPA, 600/4-79-020, Rev. 1983.

(4) See "Standard Methods for the Examination of Water and Wastewater", 17th Ed, APHA, 1989.

(5) Methods 600 through 625: see "Guidelines Establishing Test Procedures for the Analysis of Pollutants", USEPA Federal Register Vol. 49 No. 209, October 1984.

(6) Methods 500 through 599: see "Methods for the Determination of Organic Compounds in Drinking Water," USEPA 600/4-88/039, Rev. 1988.

(7) See "Methods for the Determination of Metals in Environmental Samples", Supplement I EPA-600/R-94/111, May 1994.

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(8) See "Standard Methods for the Examination of Water and Wastewater", 18th Ed., APHA, 1992.

(9) Methods 1000 through 9999: see "Test Methods for Evaluating Solid Waste", USEPA SW-846, 3rd Edition, 1986, Including Updates I and II.

(10) This method is from the 2nd Edition of "Test Methods for Evaluating Solid Waste", USEPA SW-846. It has been dropped from the 3rd Edition, 1986.

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NET NATIONAL ENVIRONMENTAL TESTING, INC.

CHAIN OF CUSTODY RECORD

COMPANY ENSR Corp
ADDRESS 740 Pasquinelli Westmont
PHONE (630) 887-1700 FAX (630) 850-5307
PROJECT NAME/LOCATION ComEd / Waukegan
PROJECT NUMBER 1801-023
PROJECT MANAGER Wei-Lin Feng

REPORT TO: Wei-Lin Feng
INVOICE TO:
P.O. NO.
NET QUOTE NO.

SAMPLED BY (PRINT NAME) Brian McReynolds — SIGNATURE Brian McReynolds
(PRINT NAME) — SIGNATURE

DATE	TIME	SAMPLE ID/DESCRIPTION	MATRIX	GRAB	COMP	# and Type of Containers: HCl	NaOH	HNO_3	H_2SO_4	OTHER	ANALYSES: pH	BNA	8013	RCRA Metals	BTEX
10/29/98	11:15	MW-1	W			3		1		4	X	X	X	X	X
	13:00	MW-2													
	10:30	MW-3													
	14:00	MW-4													
	15:00	MW-5													
	15:45	MW-6													
	9:30	MW-7													

To assist us in selecting the proper method
Is this work being conducted for regulatory compliance monitoring? Yes ___ No ___
Is this work being conducted for regulatory enforcement action? Yes ___ No ___
Which regulations apply: RCRA ___ NPDES Wastewater ___ UST ___ Drinking Water ___ Other ___ None ___

COMMENTS

~~Cool~~ pH rec'd past hold time
MW-1
MW-3
MW-7

CONDITION OF SAMPLE: BOTTLES INTACT? (YES) / NO
FIELD FILTERED? ~~YES / NO~~ N/A
COC SEALS PRESENT AND INTACT? (YES) / NO
VOLATILES FREE OF HEADSPACE? YES / (NO)
TEMPERATURE UPON RECEIPT: 2.3°C w/ice
Bottles supplied by NET? (YES) / NO

SAMPLE REMAINDER DISPOSAL: RETURN SAMPLE REMAINDER TO CLIENT VIA ___
I REQUEST NET TO DISPOSE OF ALL SAMPLE REMAINDERS ___ DATE ___

RELINQUISHED BY:	DATE	TIME	RECEIVED BY:	RELINQUISHED BY:	DATE	TIME	RECEIVED FOR NET BY:
Brian McReynolds	10/29/98	19:00			10/30/98	1245	P. Merrill

METHOD OF SHIPMENT: NET
REMARKS:

PT 1 - ORIGINAL - WHITE PT 2 - NET PROJECT MANAGER - YELLOW PT 3 - CUSTOMER COPY - PINK

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Fax: (815) 874-5622
(800) 807-2877

Mr. Wei-Lin Feng
ENSR
740 Pasquinelli Drive
Westmont, IL 60559

11/11/1998

NET Job Number: 98.13995

IEPA Cert. No.: 100221
WDNR Cert. No.: 999447130
A2LA Cert. No.: 0453-01

Enclosed is the Analytical and Quality Control reports for the following samples submitted to Bartlett Division of NET, Inc. for analysis.

Project Description: ComEd-Waukegan; 1801-023-610

Sample Number	Sample Description	Date Taken	Date Received
500396	B23 (1-3)	10/27/1998	10/29/1998
500397	S7	10/27/1998	10/29/1998
500398	B3 (1-3)	10/27/1998	10/29/1998
500399	S4	10/27/1998	10/29/1998
500400	S5	10/27/1998	10/29/1998
500401	S3	10/27/1998	10/29/1998
500402	S2	10/27/1998	10/29/1998
500403	B18 (1-3)	10/27/1998	10/29/1998
500404	S15	10/28/1998	10/29/1998
500405	S14	10/28/1998	10/29/1998
500406	S13	10/28/1998	10/29/1998
500407	B12 (1-3)	10/28/1998	10/29/1998
500408	S9	10/28/1998	10/29/1998
500409	S8	10/28/1998	10/29/1998

Sample analysis in support of the project referenced above has been completed and results are presented on the following pages. These results apply only to the samples analyzed. Reproduction of this report only in whole is permitted. Please refer to the enclosed "Key to Abbreviations" for definition of terms. Procedures used follow NET Standard Operating Procedures which reference the methods listed on your report. Should you have questions regarding procedures or results, please do not hesitate to call. NET has been pleased to provide these analytical services for you.

This Quality Control report is generated on a batch basis. All information contained in this report is for the analytical batch(es) in which your sample(s) were analyzed.

Approved by:

Mary Pearson

Mary Pearson
Project Manager

MWG13-15_45928

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ANALYTICAL REPORT

Mr. Wei-Lin Feng
ENSR
740 Pasquinelli Drive
Westmont, IL 60559

11/11/1998

Sample No. : 500396

NET Job No.: 98.13995

Sample Description: B23 (1-3)
ComEd-Waukegan; 1801-023-610

Date Taken: 10/27/1998
Time Taken: 08:10
IEPA Cert. No. 100221

Date Received: 10/29/1998
Time Received: 10:30
WDNR Cert. No. 999447130

Parameter	Results	Units	Date of Analysis	Method PQL	Analyst	Batch No. Prep/Run		Analytical Method
pH, Non-Aqueous	8.66	units	11/06/1998	0.10	nwg		195	SW 9045B
Solids, Total	81.2	%	11/04/1998	0.1	aks		2527	SM 2540
Arsenic, GFAA	4.9	mg/kg dw	11/07/1998	0.62	mhp	237	673	SW 7060
Barium, ICP	17	mg/kg dw	11/10/1998	1.2	kdw	1171	2194	SW 6010B
Cadmium, ICP	0.62	mg/kg dw	11/09/1998	0.62	kdw	1171	2178	SW 6010B
Chromium, ICP	15	mg/kg dw	11/09/1998	2.5	kdw	1171	2163	SW 6010B
Lead, ICP	18	mg/kg dw	11/05/1998	4.9	kdw	1171	2393	SW 6010B
Mercury, CVAA	0.099	mg/kg dw	11/06/1998	0.049	sep	666	770	SW 7471A
Selenium, GFAA	<0.31	mg/kg dw	11/08/1998	0.31	jtt	237	562	SW 7740
Silver, AA	<2.5	mg/kg dw	11/03/1998	2.5	sep	493	570	SW 7760
UST VOLATILES NON-AQUEOUS								
Benzene	<0.006	mg/kg dw	11/05/1998	0.006	jap		76	SW 8260A
Ethylbenzene	<0.006	mg/kg dw	11/05/1998	0.006	jap		76	SW 8260A
Toluene	<0.006	mg/kg dw	11/05/1998	0.006	jap		76	SW 8260A
Xylenes, Total	<0.006	mg/kg dw	11/05/1998	0.006	jap		76	SW 8260A
Dibromofluoromethane (Surr)	84.6	%	11/05/1998	81-129	jap		76	SW 8260A
Toluene-d8 (Surr)	86.4	%	11/05/1998	74-129	jap		76	SW 8260A
4-Bromofluoromethane (Surr)	94.6	%	11/05/1998	70-130	jap		76	SW 8260A
Prep, 8310 PNAs NON-AQUEOUS	extracted		11/05/1998		mmv	769		SW 3540C
PNA CMPDS - 8310 NONAQUEOUS								
Acenaphthene	0.028	mg/kg dw	11/07/1998	0.025	keh	769	1832	SW 8310
Acenaphthylene	<0.025	mg/kg dw	11/07/1998	0.025	keh	769	1832	SW 8310
Anthracene	0.11	mg/kg dw	11/07/1998	0.049	keh	769	1832	SW 8310
Benzo(a)anthracene	0.18	mg/kg dw	11/07/1998	0.0032	keh	769	1832	SW 8310
Benzo(b)fluoranthene	0.11	mg/kg dw	11/07/1998	0.0044	keh	769	1832	SW 8310

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ANALYTICAL REPORT

Mr. Wei-Lin Feng
ENSR
740 Pasquinelli Drive
Westmont, IL 60559

11/11/1998

Sample No. : 500396

NET Job No.: 98.13995

Sample Description: B23 (1-3)
ComEd-Waukegan; 1801-023-610

Date Taken: 10/27/1998
Time Taken: 08:10
IEPA Cert. No. 100221

Date Received: 10/29/1998
Time Received: 10:30
WDNR Cert. No. 999447130

Parameter	Results	Units	Date of Analysis	Method PQL	Analyst	Batch No. Prep/Run		Analytical Method
Benzo(k)fluoranthene	0.087	mg/kg dw	11/07/1998	0.0042	keh	769	1832	SW 8310
Benzo(a)pyrene	0.20	mg/kg dw	11/07/1998	0.0057	keh	769	1832	SW 8310
Benzo(ghi)perylene	0.14	mg/kg dw	11/07/1998	0.049	keh	769	1832	SW 8310
Chrysene	0.15	mg/kg dw	11/07/1998	0.04	keh	769	1832	SW 8310
Dibenzo(a,h)anthracene	0.020	mg/kg dw	11/07/1998	0.007	keh	769	1832	SW 8310
Fluoranthene	0.41	mg/kg dw	11/07/1998	0.025	keh	769	1832	SW 8310
Fluorene	0.041	mg/kg dw	11/07/1998	0.025	keh	769	1832	SW 8310
Indeno(1,2,3-cd)pyrene	0.10	mg/kg dw	11/07/1998	0.011	keh	769	1832	SW 8310
Naphthalene	0.068	mg/kg dw	11/07/1998	0.031	keh	769	1832	SW 8310
Phenanthrene	0.25	mg/kg dw	11/07/1998	0.049	keh	769	1832	SW 8310
Pyrene	0.39	mg/kg dw	11/07/1998	0.025	keh	769	1832	SW 8310
Surr: p-Terphenyl	Masked		11/07/1998	43-125	keh	769	1832	SW 8310
PCB Non-Aqueous Extraction	COMPLETE		11/04/1998	COMPLETE	mmv	381		SW 3540C
PCB'S NON-AQUEOUS								
PCB-1016	<0.049	mg/kg dw	11/06/1998	0.049	tls	381	60	SW 8082
PCB-1221	<0.049	mg/kg dw	11/06/1998	0.049	tls	381	60	SW 8082
PCB-1232	<0.049	mg/kg dw	11/06/1998	0.049	tls	381	60	SW 8082
PCB-1242	<0.049	mg/kg dw	11/06/1998	0.049	tls	381	60	SW 8082
PCB-1248	<0.049	mg/kg dw	11/06/1998	0.049	tls	381	60	SW 8082
PCB-1254	<0.049	mg/kg dw	11/06/1998	0.049	tls	381	60	SW 8082
PCB-1260	<0.049	mg/kg dw	11/06/1998	0.049	tls	381	60	SW 8082
Decachlorobiphenyl (Surr)	87.0	%	11/06/1998	NA	tls	381	60	SW 8082
2,4,5,6-TCMX (Surr)	81.0	%	11/06/1998	NA	tls	381	60	SW 8082

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ANALYTICAL REPORT

Mr. Wei-Lin Feng
ENSR
740 Pasquinelli Drive
Westmont, IL 60559

11/11/1998

Sample No. : 500397

NET Job No.: 98.13995

Sample Description: S7
ComEd-Waukegan; 1801-023-610

Date Taken: 10/27/1998
Time Taken: 13:45
IEPA Cert. No. 100221

Date Received: 10/29/1998
Time Received: 10:30
WDNR Cert. No. 999447130

Parameter	Results		Units	Date of Analysis	Method PQL	Analyst	Batch No. Prep/Run	Analytical Method
pH, Non-Aqueous	8.15		units	11/06/1998	0.10	nwg	195	SW 9045B
Solids, Total	72.5		%	11/04/1998	0.1	aks	2527	SM 2540
Arsenic, GFAA	5.2		mg/kg dw	11/07/1998	0.69	mhp	237 673	SW 7060
Barium, ICP	207		mg/kg dw	11/10/1998	1.4	kdw	1171 2194	SW 6010B
Cadmium, ICP	2.6		mg/kg dw	11/09/1998	0.69	kdw	1171 2178	SW 6010B
Chromium, ICP	29		mg/kg dw	11/09/1998	2.8	kdw	1171 2163	SW 6010B
Lead, ICP	70		mg/kg dw	11/09/1998	5.5	kdw	1171 2401	SW 6010B
Mercury, CVAA	0.072		mg/kg dw	11/06/1998	0.055	sep	666 770	SW 7471A
Selenium, GFAA	0.76		mg/kg dw	11/08/1998	0.34	jtt	237 562	SW 7740
Silver, AA	<2.8		mg/kg dw	11/03/1998	2.8	sep	493 570	SW 7760
Prep, TPH 8015M - NONAQUEOUS	extracted			11/02/1998		wna	245	SW 8015M
TPH MODIFIED 8015								
TPH as Gas	<69		mg/kg dw	11/04/1998	69	out	245 491	SW 8015M
TPH as Diesel	1,290	PT	mg/kg dw	11/04/1998	69	out	245 491	SW 8015M
TPH as Oil	<69		mg/kg dw	11/04/1998	69	out	245 491	SW 8015M
N-octacosane (TPH surr)	93.0		%	11/04/1998		out	245 491	SW 8015M
UST VOLATILES NON-AQUEOUS								
Benzene	<0.007		mg/kg dw	11/05/1998	0.007	jap	76	SW 8260A
Ethylbenzene	<0.007		mg/kg dw	11/05/1998	0.007	jap	76	SW 8260A
Toluene	<0.007		mg/kg dw	11/05/1998	0.007	jap	76	SW 8260A
Xylenes, Total	<0.007		mg/kg dw	11/05/1998	0.007	jap	76	SW 8260A
Dibromofluoromethane (Surr)	87.2		%	11/05/1998	81-129	jap	76	SW 8260A
Toluene-d8 (Surr)	92.8		%	11/05/1998	74-129	jap	76	SW 8260A
4-Bromofluoromethane (Surr)	91.0		%	11/05/1998	70-130	jap	76	SW 8260A
Prep, 8310 PNAs NON-AQUEOUS	extracted			11/03/1998		mmv	767	SW 3540C

PT : Pattern does not match the calibration standard; however, hydrocarbons are present in the diesel range.

NATIONAL ENVIRONMENTAL TESTING, INC.

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ANALYTICAL REPORT

Mr. Wei-Lin Feng
ENSR
740 Pasquinelli Drive
Westmont, IL 60559

11/11/1998

Sample No. : 500397

NET Job No.: 98.13995

Sample Description: S7
ComEd-Waukegan; 1801-023-610

Date Taken: 10/27/1998
Time Taken: 13:45
IEPA Cert. No. 100221

Date Received: 10/29/1998
Time Received: 10:30
WDNR Cert. No. 999447130

Parameter	Results	Units	Date of Analysis	Method PQL	Analyst	Batch No. Prep/Run		Analytical Method
PNA CMPDS - 8310 NONAQUEOUS	ELV							
Acenaphthene	<2.5	mg/kg dw	11/07/1998	0.028	keh	767	1832	SW 8310
Acenaphthylene	<2.5	mg/kg dw	11/07/1998	0.028	keh	767	1832	SW 8310
Anthracene	<5.0	mg/kg dw	11/07/1998	0.055	keh	767	1832	SW 8310
Benzo(a)anthracene	<5.7	mg/kg dw	11/07/1998	0.0036	keh	767	1832	SW 8310
Benzo(b)fluoranthene	<0.45	mg/kg dw	11/07/1998	0.0050	keh	767	1832	SW 8310
Benzo(k)fluoranthene	<0.42	mg/kg dw	11/07/1998	0.0047	keh	767	1832	SW 8310
Benzo(a)pyrene	<0.57	mg/kg dw	11/07/1998	0.0063	keh	767	1832	SW 8310
Benzo(ghi)perylene	<5.0	mg/kg dw	11/07/1998	0.055	keh	767	1832	SW 8310
Chrysene	<4	mg/kg dw	11/07/1998	0.04	keh	767	1832	SW 8310
Dibenzo(a,h)anthracene	<0.7	mg/kg dw	11/07/1998	0.008	keh	767	1832	SW 8310
Fluoranthene	<2.5	mg/kg dw	11/07/1998	0.028	keh	767	1832	SW 8310
Fluorene	<2.5	mg/kg dw	11/07/1998	0.028	keh	767	1832	SW 8310
Indeno(1,2,3-cd)pyrene	<1.1	mg/kg dw	11/07/1998	0.012	keh	767	1832	SW 8310
Naphthalene	15	mg/kg dw	11/07/1998	0.034	keh	767	1832	SW 8310
Phenanthrene	7.3	mg/kg dw	11/07/1998	0.055	keh	767	1832	SW 8310
Pyrene	<2.5	mg/kg dw	11/07/1998	0.028	keh	767	1832	SW 8310
Surr: p-Terphenyl	Diluted out		11/07/1998	43-125	keh	767	1832	SW 8310
PCB Non-Aqueous Extraction	COMPLETE		11/04/1998	COMPLETE	mmv	381		SW 3540C
PCB'S NON-AQUEOUS								
PCB-1016	<0.055	mg/kg dw	11/06/1998	0.055	tls	381	60	SW 8082
PCB-1221	<0.055	mg/kg dw	11/06/1998	0.055	tls	381	60	SW 8082
PCB-1232	<0.055	mg/kg dw	11/06/1998	0.055	tls	381	60	SW 8082
PCB-1242	<0.055	mg/kg dw	11/06/1998	0.055	tls	381	60	SW 8082
PCB-1248	<0.055	mg/kg dw	11/06/1998	0.055	tls	381	60	SW 8082
PCB-1254	0.207	mg/kg dw	11/06/1998	0.055	tls	381	60	SW 8082

ELV : Elevated reporting limits due to matrix interference.

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ANALYTICAL REPORT

Mr. Wei-Lin Feng
ENSR
740 Pasquinelli Drive
Westmont, IL 60559

11/11/1998

Sample No. : 500397

NET Job No.: 98.13995

Sample Description: S7
ComEd-Waukegan; 1801-023-610

Date Taken: 10/27/1998
Time Taken: 13:45
IEPA Cert. No. 100221

Date Received: 10/29/1998
Time Received: 10:30
WDNR Cert. No. 999447130

Parameter	Results	Units	Date of Analysis	Method PQL	Analyst	Batch No. Prep/Run		Analytical Method
PCB-1260	<0.055	mg/kg dw	11/06/1998	0.055	tls	381	60	SW 8082
Decachlorobiphenyl (Surr)	70.0	%	11/06/1998	NA	tls	381	60	SW 8082
2,4,5,6-TCMX (Surr)	81.0	%	11/06/1998	NA	tls	381	60	SW 8082

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ANALYTICAL REPORT

Mr. Wei-Lin Feng
ENSR
740 Pasquinelli Drive
Westmont, IL 60559

11/11/1998

Sample No. : 500398

NET Job No.: 98.13995

Sample Description: B3 (1-3)
ComEd-Waukegan; 1801-023-610

Date Taken: 10/27/1998
Time Taken: 13:50
IEPA Cert. No. 100221

Date Received: 10/29/1998
Time Received: 10:30
WDNR Cert. No. 999447130

Parameter	Results	Units	Date of Analysis	Method PQL	Analyst	Batch No. Prep/Run	Analytical Method
pH, Non-Aqueous	7.41	units	11/06/1998	0.10	nwg	195	SW 9045B
Solids, Total	86.1	%	11/04/1998	0.1	aks	2527	SM 2540
Arsenic, GFAA	4.2	mg/kg dw	11/07/1998	0.58	mhp	237 673	SW 7060
Barium, ICP	38	mg/kg dw	11/10/1998	1.2	kdw	1171 2194	SW 6010B
Cadmium, ICP	0.84	mg/kg dw	11/09/1998	0.58	kdw	1171 2178	SW 6010B
Chromium, ICP	14	mg/kg dw	11/09/1998	2.3	kdw	1171 2163	SW 6010B
Lead, ICP	21	mg/kg dw	11/09/1998	4.6	kdw	1171 2401	SW 6010B
Mercury, CVAA	0.050	mg/kg dw	11/06/1998	0.046	sep	666 770	SW 7471A
Selenium, GFAA	<0.29	mg/kg dw	11/08/1998	0.29	jtt	237 562	SW 7740
Silver, AA	<2.3	mg/kg dw	11/03/1998	2.3	sep	493 570	SW 7760
UST VOLATILES NON-AQUEOUS							
Benzene	<0.006	mg/kg dw	11/05/1998	0.006	jap	76	SW 8260A
Ethylbenzene	<0.006	mg/kg dw	11/05/1998	0.006	jap	76	SW 8260A
Toluene	<0.006	mg/kg dw	11/05/1998	0.006	jap	76	SW 8260A
Xylenes, Total	<0.006	mg/kg dw	11/05/1998	0.006	jap	76	SW 8260A
Dibromofluoromethane (Surr)	95.8	%	11/05/1998	81-129	jap	76	SW 8260A
Toluene-d8 (Surr)	84.4	%	11/05/1998	74-129	jap	76	SW 8260A
4-Bromofluoromethane (Surr)	80.4	%	11/05/1998	70-130	jap	76	SW 8260A
Prep, 8310 PNAs NON-AQUEOUS	extracted		11/03/1998		mmv	768	SW 3540C
PNA CMPDS - 8310 NONAQUEOUS	ELV						
Acenaphthene	<0.23	mg/kg dw	11/07/1998	0.023	keh	768 1832	SW 8310
Acenaphthylene	<0.23	mg/kg dw	11/07/1998	0.023	keh	768 1832	SW 8310
Anthracene	<1.1	mg/kg dw	11/07/1998	0.046	keh	768 1832	SW 8310
Benzo(a)anthracene	0.46	mg/kg dw	11/07/1998	0.0030	keh	768 1832	SW 8310
Benzo(b)fluoranthene	0.22	mg/kg dw	11/07/1998	0.0042	keh	768 1832	SW 8310

ELV : Elevated reporting limits due to matrix interference.

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ANALYTICAL REPORT

Mr. Wei-Lin Feng
ENSR
740 Pasquinelli Drive
Westmont, IL 60559

11/11/1998

Sample No. : 500398

NET Job No.: 98.13995

Sample Description: B3 (1-3)
ComEd-Waukegan; 1801-023-610

Date Taken: 10/27/1998
Time Taken: 13:50
IEPA Cert. No. 100221

Date Received: 10/29/1998
Time Received: 10:30
WDNR Cert. No. 999447130

Parameter	Results	Units	Date of Analysis	Method PQL	Analyst	Batch No. Prep/Run		Analytical Method
Benzo(k)fluoranthene	0.15	mg/kg dw	11/07/1998	0.0039	keh	768	1832	SW 8310
Benzo(a)pyrene	0.24	mg/kg dw	11/07/1998	0.0053	keh	768	1832	SW 8310
Benzo(ghi)perylene	<0.46	mg/kg dw	11/07/1998	0.046	keh	768	1832	SW 8310
Chrysene	<0.3	mg/kg dw	11/07/1998	0.03	keh	768	1832	SW 8310
Dibenzo(a,h)anthracene	<0.07	mg/kg dw	11/07/1998	0.007	keh	768	1832	SW 8310
Fluoranthene	<1.4	mg/kg dw	11/07/1998	0.023	keh	768	1832	SW 8310
Fluorene	<0.46	mg/kg dw	11/07/1998	0.023	keh	768	1832	SW 8310
Indeno(1,2,3-cd)pyrene	<0.10	mg/kg dw	11/07/1998	0.010	keh	768	1832	SW 8310
Naphthalene	1.4	mg/kg dw	11/07/1998	0.029	keh	768	1832	SW 8310
Phenanthrene	1.5	mg/kg dw	11/07/1998	0.046	keh	768	1832	SW 8310
Pyrene	<1.9	mg/kg dw	11/07/1998	0.023	keh	768	1832	SW 8310
Surr: p-Terphenyl	Masked		11/07/1998	43-125	keh	768	1832	SW 8310
PCB Non-Aqueous Extraction	COMPLETE		11/04/1998	COMPLETE	mmv	381		SW 3540C
PCB'S NON-AQUEOUS								
PCB-1016	<0.046	mg/kg dw	11/07/1998	0.046	tls	381	60	SW 8082
PCB-1221	<0.046	mg/kg dw	11/07/1998	0.046	tls	381	60	SW 8082
PCB-1232	<0.046	mg/kg dw	11/07/1998	0.046	tls	381	60	SW 8082
PCB-1242	<0.046	mg/kg dw	11/07/1998	0.046	tls	381	60	SW 8082
PCB-1248	<0.046	mg/kg dw	11/07/1998	0.046	tls	381	60	SW 8082
PCB-1254	<0.046	mg/kg dw	11/07/1998	0.046	tls	381	60	SW 8082
PCB-1260	<0.046	mg/kg dw	11/07/1998	0.046	tls	381	60	SW 8082
Decachlorobiphenyl (Surr)	65.0	%	11/07/1998	NA	tls	381	60	SW 8082
2,4,5,6-TCMX (Surr)	90.0	%	11/07/1998	NA	tls	381	60	SW 8082

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ANALYTICAL REPORT

Mr. Wei-Lin Feng
ENSR
740 Pasquinelli Drive
Westmont, IL 60559

11/11/1998

Sample No. : 500399

NET Job No.: 98.13995

Sample Description: S4
ComEd-Waukegan; 1801-023-610

Date Taken: 10/27/1998
Time Taken: 14:10
IEPA Cert. No. 100221

Date Received: 10/29/1998
Time Received: 10:30
WDNR Cert. No. 999447130

Parameter	Results	Units	Date of Analysis	Method PQL	Analyst	Batch No. Prep/Run	Analytical Method
pH, Non-Aqueous	7.10	units	11/06/1998	0.10	nwg	195	SW 9045B
Solids, Total	96.5	%	11/04/1998	0.1	aks	2527	SM 2540
Arsenic, GFAA	3.7	mg/kg dw	11/07/1998	0.52	mhp	237 673	SW 7060
Barium, ICP	124	mg/kg dw	11/10/1998	1.0	kdw	1171 2194	SW 6010B
Cadmium, ICP	6.2	mg/kg dw	11/09/1998	0.52	kdw	1171 2178	SW 6010B
Chromium, ICP	104	mg/kg dw	11/09/1998	2.1	kdw	1171 2163	SW 6010B
Lead, ICP	48	mg/kg dw	11/09/1998	4.1	kdw	1171 2401	SW 6010B
Mercury, CVAA	<0.041	mg/kg dw	11/10/1998	0.041	sep	668 772	SW 7471A
Selenium, GFAA	<0.26	mg/kg dw	11/08/1998	0.26	jtt	237 562	SW 7740
Silver, AA	<2.1	mg/kg dw	11/03/1998	2.1	sep	493 570	SW 7760
Prep, TPH 8015M - NONAQUEOUS	extracted		11/02/1998		wna	245	SW 8015M
TPH MODIFIED 8015							
TPH as Gas	<518	mg/kg dw	11/04/1998	52	out	245 491	SW 8015M
TPH as Diesel	<518	mg/kg dw	11/04/1998	52	out	245 491	SW 8015M
TPH as Oil	14,900 PT	mg/kg dw	11/04/1998	52	out	245 491	SW 8015M
N-octacosane (TPH surr)	Diluted out	mg/kg dw	11/04/1998		out	245 491	SW 8015M
UST VOLATILES NON-AQUEOUS							
Benzene	<0.005	mg/kg dw	11/05/1998	0.005	jap	76	SW 8260A
Ethylbenzene	<0.005	mg/kg dw	11/05/1998	0.005	jap	76	SW 8260A
Toluene	<0.005	mg/kg dw	11/05/1998	0.005	jap	76	SW 8260A
Xylenes, Total	<0.005	mg/kg dw	11/05/1998	0.005	jap	76	SW 8260A
Dibromofluoromethane (Surr)	98.2	%	11/05/1998	81-129	jap	76	SW 8260A
Toluene-d8 (Surr)	83.6	%	11/05/1998	74-129	jap	76	SW 8260A
4-Bromofluoromethane (Surr)	89.6	%	11/05/1998	70-130	jap	76	SW 8260A
Prep, 8310 PNAs NON-AQUEOUS	extracted		11/03/1998		mmv	768	SW 3540C

PT : Pattern does not match the calibration standard; however, hydrocarbons are present in the oil range.

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ANALYTICAL REPORT

Mr. Wei-Lin Feng
ENSR
740 Pasquinelli Drive
Westmont, IL 60559

11/11/1998

Sample No. : 500399

NET Job No.: 98.13995

Sample Description: S4
ComEd-Waukegan; 1801-023-610

Date Taken: 10/27/1998
Time Taken: 14:10
IEPA Cert. No. 100221

Date Received: 10/29/1998
Time Received: 10:30
WDNR Cert. No. 999447130

Parameter	Results	Units	Date of Analysis	Method PQL	Analyst	Batch No. Prep/Run		Analytical Method
PNA CMPDS - 8310 NONAQUEOUS	ELV							
Acenaphthene	<0.94	mg/kg dw	11/07/1998	0.021	keh	768	1832	SW 8310
Acenaphthylene	<0.94	mg/kg dw	11/07/1998	0.021	keh	768	1832	SW 8310
Anthracene	<1.8	mg/kg dw	11/07/1998	0.041	keh	768	1832	SW 8310
Benzo(a)anthracene	<1.1	mg/kg dw	11/07/1998	0.0027	keh	768	1832	SW 8310
Benzo(b)fluoranthene	<0.49	mg/kg dw	11/07/1998	0.0037	keh	768	1832	SW 8310
Benzo(k)fluoranthene	<0.16	mg/kg dw	11/07/1998	0.0035	keh	768	1832	SW 8310
Benzo(a)pyrene	<0.22	mg/kg dw	11/07/1998	0.0048	keh	768	1832	SW 8310
Benzo(ghi)perylene	<1.8	mg/kg dw	11/07/1998	0.041	keh	768	1832	SW 8310
Chrysene	<1	mg/kg dw	11/07/1998	0.03	keh	768	1832	SW 8310
Dibenzo(a,h)anthracene	<0.3	mg/kg dw	11/07/1998	0.006	keh	768	1832	SW 8310
Fluoranthene	<0.94	mg/kg dw	11/07/1998	0.021	keh	768	1832	SW 8310
Fluorene	<0.94	mg/kg dw	11/07/1998	0.021	keh	768	1832	SW 8310
Indeno(1,2,3-cd)pyrene	<0.40	mg/kg dw	11/07/1998	0.0089	keh	768	1832	SW 8310
Naphthalene	<1.2	mg/kg dw	11/07/1998	0.026	keh	768	1832	SW 8310
Phenanthrene	<1.8	mg/kg dw	11/07/1998	0.041	keh	768	1832	SW 8310
Pyrene	<0.94	mg/kg dw	11/07/1998	0.021	keh	768	1832	SW 8310
Surr: p-Terphenyl	Diluted out		11/07/1998	43-125	keh	768	1832	SW 8310
PCB Non-Aqueous Extraction	COMPLETE		11/04/1998	COMPLETE	mmv	381		SW 3540C
PCB'S NON-AQUEOUS	ELV							
PCB-1016	<0.41	mg/kg dw	11/07/1998	0.041	tls	381	60	SW 8082
PCB-1221	<0.41	mg/kg dw	11/07/1998	0.041	tls	381	60	SW 8082
PCB-1232	<0.41	mg/kg dw	11/07/1998	0.041	tls	381	60	SW 8082
PCB-1242	<0.41	mg/kg dw	11/07/1998	0.041	tls	381	60	SW 8082
PCB-1248	<0.41	mg/kg dw	11/07/1998	0.041	tls	381	60	SW 8082
PCB-1254	<0.41	mg/kg dw	11/07/1998	0.041	tls	381	60	SW 8082

ELV : Elevated reporting limits due to matrix interference.

NATIONAL ENVIRONMENTAL TESTING, INC.

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ANALYTICAL REPORT

Mr. Wei-Lin Feng
ENSR
740 Pasquinelli Drive
Westmont, IL 60559

11/11/1998

Sample No. : 500399

NET Job No.: 98.13995

Sample Description: S4
ComEd-Waukegan; 1801-023-610

Date Taken: 10/27/1998
Time Taken: 14:10
IEPA Cert. No. 100221

Date Received: 10/29/1998
Time Received: 10:30
WDNR Cert. No. 999447130

Parameter	Results	Units	Date of Analysis	Method PQL	Analyst	Batch No. Prep/Run		Analytical Method
PCB-1260	<0.41	mg/kg dw	11/07/1998	0.041	tls	381	60	SW 8082
Decachlorobiphenyl (Surr)	123.0	%	11/07/1998	NA	tls	381	60	SW 8082
2,4,5,6-TCMX (Surr)	95.0	%	11/07/1998	NA	tls	381	60	SW 8082

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ANALYTICAL REPORT

Mr. Wei-Lin Feng
ENSR
740 Pasquinelli Drive
Westmont, IL 60559

11/11/1998

Sample No. : 500400

NET Job No.: 98.13995

Sample Description: S5
ComEd-Waukegan; 1801-023-610

Date Taken: 10/27/1998
Time Taken: 14:25
IEPA Cert. No. 100221

Date Received: 10/29/1998
Time Received: 10:30
WDNR Cert. No. 999447130

Parameter	Results		Units	Date of Analysis	Method PQL	Analyst	Batch No. Prep/Run		Analytical Method
pH, Non-Aqueous	7.76		units	11/06/1998	0.10	nwg		195	SW 9045B
Solids, Total	90.3		%	11/04/1998	0.1	aks		2527	SM 2540
Arsenic, GFAA	5.3		mg/kg dw	11/07/1998	0.55	mhp	237	673	SW 7060
Barium, ICP	42		mg/kg dw	11/10/1998	1.1	kdw	1171	2194	SW 6010B
Cadmium, ICP	13		mg/kg dw	11/09/1998	0.55	kdw	1171	2178	SW 6010B
Chromium, ICP	13		mg/kg dw	11/09/1998	2.2	kdw	1171	2163	SW 6010B
Lead, ICP	33		mg/kg dw	11/09/1998	4.4	kdw	1171	2401	SW 6010B
Mercury, CVAA	<0.044		mg/kg dw	11/10/1998	0.044	sep	668	772	SW 7471A
Selenium, GFAA	<0.28		mg/kg dw	11/08/1998	0.28	jtt	237	562	SW 7740
Silver, AA	<2.2		mg/kg dw	11/06/1998	2.2	sep	495	572	SW 7760
Prep, TPH 8015M - NONAQUEOUS	extracted			11/02/1998		wna	245		SW 8015M
TPH MODIFIED 8015									
TPH as Gas	472	PT	mg/kg dw	11/04/1998	55	out	245	491	SW 8015M
TPH as Diesel	<55		mg/kg dw	11/04/1998	55	out	245	491	SW 8015M
TPH as Oil	4,710	PT	mg/kg dw	11/04/1998	55	out	245	491	SW 8015M
N-octacosane (TPH surr)	42.0		%	11/04/1998		out	245	491	SW 8015M
UST VOLATILES NON-AQUEOUS									
Benzene	<0.006		mg/kg dw	11/06/1998	0.006	jap		78	SW 8260A
Ethylbenzene	<0.006		mg/kg dw	11/06/1998	0.006	jap		78	SW 8260A
Toluene	<0.006		mg/kg dw	11/06/1998	0.006	jap		78	SW 8260A
Xylenes, Total	<0.006		mg/kg dw	11/06/1998	0.006	jap		78	SW 8260A
Dibromofluoromethane (Surr)	87.8		%	11/06/1998	81-129	jap		78	SW 8260A
Toluene-d8 (Surr)	89.0		%	11/06/1998	74-129	jap		78	SW 8260A
4-Bromofluoromethane (Surr)	95.2		%	11/06/1998	70-130	jap		78	SW 8260A
Prep, 8310 PNAs NON-AQUEOUS	extracted			11/03/1998		mmv	768		SW 3540C

PT : Pattern does not match the calibration standard; however, hydrocarbons are present in the gas/oil range.

NATIONAL ENVIRONMENTAL TESTING, INC.

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ANALYTICAL REPORT

Mr. Wei-Lin Feng
ENSR
740 Pasquinelli Drive
Westmont, IL 60559

11/11/1998

Sample No. : 500400

NET Job No.: 98.13995

Sample Description: S5
ComEd-Waukegan; 1801-023-610

Date Taken: 10/27/1998
Time Taken: 14:25
IEPA Cert. No. 100221

Date Received: 10/29/1998
Time Received: 10:30
WDNR Cert. No. 999447130

Parameter	Results	Units	Date of Analysis	Method PQL	Analyst	Batch No. Prep/Run		Analytical Method
PNA CMPDS - 8310 NONAQUEOUS	ELV							
Acenaphthene	<0.2	mg/kg dw	11/07/1998	0.022	keh	768	1832	SW 8310
Acenaphthylene	<0.2	mg/kg dw	11/07/1998	0.022	keh	768	1832	SW 8310
Anthracene	<0.61	mg/kg dw	11/07/1998	0.044	keh	768	1832	SW 8310
Benzo(a)anthracene	<0.81	mg/kg dw	11/07/1998	0.0029	keh	768	1832	SW 8310
Benzo(b)fluoranthene	0.078	mg/kg dw	11/07/1998	0.0040	keh	768	1832	SW 8310
Benzo(k)fluoranthene	<0.31	mg/kg dw	11/07/1998	0.0038	keh	768	1832	SW 8310
Benzo(a)pyrene	<0.14	mg/kg dw	11/07/1998	0.0051	keh	768	1832	SW 8310
Benzo(ghi)perylene	<0.4	mg/kg dw	11/07/1998	0.044	keh	768	1832	SW 8310
Chrysene	<0.2	mg/kg dw	11/07/1998	0.03	keh	768	1832	SW 8310
Dibenzo(a,h)anthracene	<0.06	mg/kg dw	11/07/1998	0.007	keh	768	1832	SW 8310
Fluoranthene	<0.75	mg/kg dw	11/07/1998	0.022	keh	768	1832	SW 8310
Fluorene	<0.2	mg/kg dw	11/07/1998	0.022	keh	768	1832	SW 8310
Indeno(1,2,3-cd)pyrene	<0.08	mg/kg dw	11/07/1998	0.0095	keh	768	1832	SW 8310
Naphthalene	<0.2	mg/kg dw	11/07/1998	0.028	keh	768	1832	SW 8310
Phenanthrene	1.2	mg/kg dw	11/07/1998	0.044	keh	768	1832	SW 8310
Pyrene	0.41	mg/kg dw	11/07/1998	0.022	keh	768	1832	SW 8310
Surr: p-Terphenyl	Masked		11/07/1998	43-125	keh	768	1832	SW 8310
PCB Non-Aqueous Extraction	COMPLETE		11/04/1998	COMPLETE	mmv	381		SW 3540C
PCB'S NON-AQUEOUS								
PCB-1016	<0.044	mg/kg dw	11/07/1998	0.044	tls	381	60	SW 8082
PCB-1221	<0.044	mg/kg dw	11/07/1998	0.044	tls	381	60	SW 8082
PCB-1232	<0.044	mg/kg dw	11/07/1998	0.044	tls	381	60	SW 8082
PCB-1242	0.075	mg/kg dw	11/07/1998	0.044	tls	381	60	SW 8082
PCB-1248	<0.044	mg/kg dw	11/07/1998	0.044	tls	381	60	SW 8082
PCB-1254	0.266	mg/kg dw	11/07/1998	0.044	tls	381	60	SW 8082

ELV : Elevated reporting limits due to matrix interference.

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ANALYTICAL REPORT

Mr. Wei-Lin Feng
ENSR
740 Pasquinelli Drive
Westmont, IL 60559

11/11/1998

Sample No. : 500400

NET Job No.: 98.13995

Sample Description: S5
ComEd-Waukegan; 1801-023-610

Date Taken: 10/27/1998
Time Taken: 14:25
IEPA Cert. No. 100221

Date Received: 10/29/1998
Time Received: 10:30
WDNR Cert. No. 999447130

Parameter	Results	Units	Date of Analysis	Method PQL	Analyst	Batch No. Prep/Run	Analytical Method
PCB-1260	<0.044	mg/kg dw	11/07/1998	0.044	tls	381 60	SW 8082
Decachlorobiphenyl (Surr)	87.0	%	11/07/1998	NA	tls	381 60	SW 8082
2,4,5,6-TCMX (Surr)	91.0	%	11/07/1998	NA	tls	381 60	SW 8082

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ANALYTICAL REPORT

Mr. Wei-Lin Feng
ENSR
740 Pasquinelli Drive
Westmont, IL 60559

11/11/1998

Sample No. : 500401

NET Job No.: 98.13995

Sample Description: S3
ComEd-Waukegan; 1801-023-610

Date Taken: 10/27/1998
Time Taken: 14:35
IEPA Cert. No. 100221

Date Received: 10/29/1998
Time Received: 10:30
WDNR Cert. No. 999447130

Parameter	Results	Units	Date of Analysis	Method PQL	Analyst	Batch No. Prep/Run	Analytical Method
pH, Non-Aqueous	8.72	units	11/06/1998	0.10	nwg	195	SW 9045B
Solids, Total	85.3	%	11/04/1998	0.1	aks	2527	SM 2540
Arsenic, GFAA	1.6	mg/kg dw	11/07/1998	0.59	mhp	237 673	SW 7060
Barium, ICP	9.5	mg/kg dw	11/10/1998	1.2	kdw	1171 2194	SW 6010B
Cadmium, ICP	<0.59	mg/kg dw	11/09/1998	0.59	kdw	1171 2178	SW 6010B
Chromium, ICP	7.6	mg/kg dw	11/09/1998	2.3	kdw	1171 2163	SW 6010B
Lead, ICP	11	mg/kg dw	11/09/1998	4.7	kdw	1171 2401	SW 6010B
Mercury, CVAA	<0.047	mg/kg dw	11/06/1998	0.047	sep	666 770	SW 7471A
Selenium, GFAA	<0.29	mg/kg dw	11/08/1998	0.29	jtt	237 562	SW 7740
Silver, AA	<2.3	mg/kg dw	11/06/1998	2.3	sep	495 572	SW 7760
Prep, TPH 8015M - NONAQUEOUS	extracted		11/02/1998		wna	245	SW 8015M
TPH MODIFIED 8015							
TPH as Gas	<59	mg/kg dw	11/04/1998	59	out	245 491	SW 8015M
TPH as Diesel	<59	mg/kg dw	11/04/1998	59	out	245 491	SW 8015M
TPH as Oil	<59	mg/kg dw	11/04/1998	59	out	245 491	SW 8015M
N-octacosane (TPH surr)	97.0	%	11/04/1998		out	245 491	SW 8015M
UST VOLATILES NON-AQUEOUS							
Benzene	<0.006	mg/kg dw	11/05/1998	0.006	jap	76	SW 8260A
Ethylbenzene	<0.006	mg/kg dw	11/05/1998	0.006	jap	76	SW 8260A
Toluene	<0.006	mg/kg dw	11/05/1998	0.006	jap	76	SW 8260A
Xylenes, Total	<0.006	mg/kg dw	11/05/1998	0.006	jap	76	SW 8260A
Dibromofluoromethane (Surr)	91.6	%	11/05/1998	81-129	jap	76	SW 8260A
Toluene-d8 (Surr)	94.6	%	11/05/1998	74-129	jap	76	SW 8260A
4-Bromofluoromethane (Surr)	97.8	%	11/05/1998	70-130	jap	76	SW 8260A
Prep, 8310 PNAs NON-AQUEOUS	extracted		11/03/1998		mmv	768	SW 3540C

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ANALYTICAL REPORT

Mr. Wei-Lin Feng
ENSR
740 Pasquinelli Drive
Westmont, IL 60559

11/11/1998

Sample No. : 500401

NET Job No.: 98.13995

Sample Description: S3
ComEd-Waukegan; 1801-023-610

Date Taken: 10/27/1998
Time Taken: 14:35
IEPA Cert. No. 100221

Date Received: 10/29/1998
Time Received: 10:30
WDNR Cert. No. 999447130

Parameter	Results		Units	Date of Analysis	Method PQL	Analyst	Batch No. Prep/Run		Analytical Method
PNA CMPDS - 8310 NONAQUEOUS									
Acenaphthene	<0.023		mg/kg dw	11/07/1998	0.023	keh	768	1832	SW 8310
Acenaphthylene	<0.023		mg/kg dw	11/07/1998	0.023	keh	768	1832	SW 8310
Anthracene	<0.093	MX	mg/kg dw	11/07/1998	0.047	keh	768	1832	SW 8310
Benzo(a)anthracene	<0.10	MX	mg/kg dw	11/07/1998	0.0030	keh	768	1832	SW 8310
Benzo(b)fluoranthene	0.018		mg/kg dw	11/07/1998	0.0042	keh	768	1832	SW 8310
Benzo(k)fluoranthene	0.023		mg/kg dw	11/07/1998	0.0040	keh	768	1832	SW 8310
Benzo(a)pyrene	0.030		mg/kg dw	11/07/1998	0.0054	keh	768	1832	SW 8310
Benzo(ghi)perylene	<0.047		mg/kg dw	11/07/1998	0.047	keh	768	1832	SW 8310
Chrysene	0.041		mg/kg dw	11/07/1998	0.04	keh	768	1832	SW 8310
Dibenzo(a,h)anthracene	0.0083		mg/kg dw	11/07/1998	0.007	keh	768	1832	SW 8310
Fluoranthene	0.10		mg/kg dw	11/07/1998	0.023	keh	768	1832	SW 8310
Fluorene	0.033		mg/kg dw	11/07/1998	0.023	keh	768	1832	SW 8310
Indeno(1,2,3-cd)pyrene	0.021		mg/kg dw	11/07/1998	0.010	keh	768	1832	SW 8310
Naphthalene	0.042		mg/kg dw	11/07/1998	0.029	keh	768	1832	SW 8310
Phenanthrene	0.11		mg/kg dw	11/07/1998	0.047	keh	768	1832	SW 8310
Pyrene	0.056		mg/kg dw	11/07/1998	0.023	keh	768	1832	SW 8310
Surr: p-Terphenyl	Masked			11/07/1998	43-125	keh	768	1832	SW 8310
PCB Non-Aqueous Extraction	COMPLETE			11/04/1998	COMPLETE	mmv	381		SW 3540C
PCB'S NON-AQUEOUS									
PCB-1016	<0.047		mg/kg dw	11/07/1998	0.047	tls	381	60	SW 8082
PCB-1221	<0.047		mg/kg dw	11/07/1998	0.047	tls	381	60	SW 8082
PCB-1232	<0.047		mg/kg dw	11/07/1998	0.047	tls	381	60	SW 8082
PCB-1242	<0.047		mg/kg dw	11/07/1998	0.047	tls	381	60	SW 8082
PCB-1248	0.073		mg/kg dw	11/11/1998	0.047	tls	381	62	SW 8082
PCB-1254	<0.047		mg/kg dw	11/07/1998	0.047	tls	381	60	SW 8082

MX : Dilution required due to sample matrix; analyte is not detected.

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ANALYTICAL REPORT

Mr. Wei-Lin Feng
ENSR
740 Pasquinelli Drive
Westmont, IL 60559

11/11/1998

Sample No. : 500401

NET Job No.: 98.13995

Sample Description: S3
ComEd-Waukegan; 1801-023-610

Date Taken: 10/27/1998
Time Taken: 14:35
IEPA Cert. No. 100221

Date Received: 10/29/1998
Time Received: 10:30
WDNR Cert. No. 999447130

Parameter	Results	Units	Date of Analysis	Method PQL	Analyst	Batch No. Prep/Run		Analytical Method
PCB-1260	<0.047	mg/kg dw	11/07/1998	0.047	tls	381	60	SW 8082
Decachlorobiphenyl (Surr)	80.0	%	11/07/1998	NA	tls	381	60	SW 8082
2,4,5,6-TCMX (Surr)	80.0	%	11/07/1998	NA	tls	381	60	SW 8082

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ANALYTICAL REPORT

Mr. Wei-Lin Feng
ENSR
740 Pasquinelli Drive
Westmont, IL 60559

11/11/1998

Sample No. : 500402

NET Job No.: 98.13995

Sample Description: S2
ComEd-Waukegan; 1801-023-610

Date Taken: 10/27/1998
Time Taken: 14:45
IEPA Cert. No. 100221

Date Received: 10/29/1998
Time Received: 10:30
WDNR Cert. No. 999447130

Parameter	Results	Units	Date of Analysis	Method PQL	Analyst	Batch No. Prep/Run		Analytical Method
pH, Non-Aqueous	6.93	units	11/06/1998	0.10	nwg		195	SW 9045B
Solids, Total	55.3	%	11/04/1998	0.1	aks		2527	SM 2540
Arsenic, GFAA	6.5	mg/kg dw	11/07/1998	0.90	mhp	238	673	SW 7060
Barium, ICP	150	mg/kg dw	11/09/1998	1.8	kdw	1172	2194	SW 6010B
Cadmium, ICP	6.0	mg/kg dw	11/09/1998	0.90	kdw	1172	2178	SW 6010B
Chromium, ICP	29	mg/kg dw	11/09/1998	3.6	kdw	1172	2163	SW 6010B
Lead, ICP	130	mg/kg dw	11/09/1998	7.2	kdw	1172	2401	SW 6010B
Mercury, CVAA	0.16	mg/kg dw	11/06/1998	0.072	sep	666	770	SW 7471A
Selenium, GFAA	0.51	mg/kg dw	11/08/1998	0.45	jtt	238	562	SW 7740
Silver, AA	<3.6	mg/kg dw	11/06/1998	3.6	sep	495	572	SW 7760
Prep, TPH 8015M - NONAQUEOUS	extracted		11/02/1998		wna	245		SW 8015M
TPH MODIFIED 8015								
TPH as Gas	<904	mg/kg dw	11/04/1998	90	out	245	491	SW 8015M
TPH as Diesel	94,000 PT	mg/kg dw	11/04/1998	90	out	245	491	SW 8015M
TPH as Oil	<904	mg/kg dw	11/04/1998	90	out	245	491	SW 8015M
N-octacosane (TPH surr)	Diluted out	mg/kg dw	11/04/1998		out	245	491	SW 8015M
UST VOLATILES NON-AQUEOUS								
Benzene	0.020	mg/kg dw	11/06/1998	0.009	jap		78	SW 8260A
Ethylbenzene	0.36	mg/kg dw	11/06/1998	0.009	jap		78	SW 8260A
Toluene	0.61	mg/kg dw	11/06/1998	0.009	jap		78	SW 8260A
Xylenes, Total	3.6	mg/kg dw	11/06/1998	0.009	jap		78	SW 8260A
Dibromofluoromethane (Surr)	94.6	%	11/06/1998	81-129	jap		78	SW 8260A
Toluene-d8 (Surr)	95.6	%	11/06/1998	74-129	jap		78	SW 8260A
4-Bromofluoromethane (Surr)	64.0	%	11/06/1998	70-130	jap		78	SW 8260A
Prep, 8310 PNAs NON-AQUEOUS	extracted		11/03/1998		mmv	768		SW 3540C

PT : Pattern does not match the calibration standard; however, hydrocarbons are present in the diesel range.

NET NATIONAL ENVIRONMENTAL TESTING, INC.

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ANALYTICAL REPORT

Mr. Wei-Lin Feng
ENSR
740 Pasquinelli Drive
Westmont, IL 60559

11/11/1998

Sample No. : 500402

NET Job No.: 98.13995

Sample Description: S2
ComEd-Waukegan; 1801-023-610

Date Taken: 10/27/1998
Time Taken: 14:45
IEPA Cert. No. 100221

Date Received: 10/29/1998
Time Received: 10:30
WDNR Cert. No. 999447130

Parameter	Results	Units	Date of Analysis	Method PQL	Analyst	Batch No. Prep/Run		Analytical Method
PNA CMPDS - 8310 NONAQUEOUS	ELV							
Acenaphthene	<2.9	mg/kg dw	11/07/1998	0.036	keh	768	1832	SW 8310
Acenaphthylene	<2.9	mg/kg dw	11/07/1998	0.036	keh	768	1832	SW 8310
Anthracene	<85	mg/kg dw	11/07/1998	0.072	keh	768	1832	SW 831C
Benzo(a)anthracene	<5.8	mg/kg dw	11/07/1998	0.0047	keh	768	1832	SW 8310
Benzo(b)fluoranthene	<0.52	mg/kg dw	11/07/1998	0.0065	keh	768	1832	SW 8310
Benzo(k)fluoranthene	<0.49	mg/kg dw	11/07/1998	0.0061	keh	768	1832	SW 8310
Benzo(a)pyrene	<0.66	mg/kg dw	11/07/1998	0.0083	keh	768	1832	SW 8310
Benzo(ghi)perylene	<5.8	mg/kg dw	11/07/1998	0.072	keh	768	1832	SW 8310
Chrysene	<4	mg/kg dw	11/07/1998	0.05	keh	768	1832	SW 8310
Dibenzo(a,h)anthracene	<0.8	mg/kg dw	11/07/1998	0.01	keh	768	1832	SW 8310
Fluoranthene	<52	mg/kg dw	11/07/1998	0.036	keh	768	1832	SW 8310
Fluorene	<16	mg/kg dw	11/07/1998	0.036	keh	768	1832	SW 8310
Indeno(1,2,3-cd)pyrene	<1.3	mg/kg dw	11/07/1998	0.016	keh	768	1832	SW 8310
Naphthalene	65	mg/kg dw	11/07/1998	0.045	keh	768	1832	SW 8310
Phenanthrene	<8.9	mg/kg dw	11/07/1998	0.072	keh	768	1832	SW 8310
Pyrene	<42	mg/kg dw	11/07/1998	0.036	keh	768	1832	SW 8310
Surr: p-Terphenyl	Diluted out		11/07/1998	43-125	keh	768	1832	SW 8310
PCB Non-Aqueous Extraction	COMPLETE		11/04/1998	COMPLETE	mmv	381		SW 3540C
PCB'S NON-AQUEOUS	ELV							
PCB-1016	<0.22	mg/kg dw	11/07/1998	0.072	tls	381	60	SW 8082
PCB-1221	<0.22	mg/kg dw	11/07/1998	0.072	tls	381	60	SW 8082
PCB-1232	<0.22	mg/kg dw	11/07/1998	0.072	tls	381	60	SW 8082
PCB-1242	<0.22	mg/kg dw	11/07/1998	0.072	tls	381	60	SW 8082
PCB-1248	<0.22	mg/kg dw	11/07/1998	0.072	tls	381	60	SW 8082
PCB-1254	0.24	mg/kg dw	11/07/1998	0.072	tls	381	60	SW 8082

ELV : Elevated reporting limits due to matrix interference.

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NATIONAL ENVIRONMENTAL TESTING, INC.

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ANALYTICAL REPORT

Mr. Wei-Lin Feng
ENSR
740 Pasquinelli Drive
Westmont, IL 60559

11/11/1998

Sample No. : 500402

NET Job No.: 98.13995

Sample Description: S2
ComEd-Waukegan; 1801-023-610

Date Taken: 10/27/1998
Time Taken: 14:45
IEPA Cert. No. 100221

Date Received: 10/29/1998
Time Received: 10:30
WDNR Cert. No. 999447130

Parameter	Results	Units	Date of Analysis	Method PQL	Analyst	Batch No. Prep/Run		Analytical Method
PCB-1260	<0.22	mg/kg dw	11/07/1998	0.072	tls	381	60	SW 8082
Decachlorobiphenyl (Surr)	80.0	%	11/07/1998	NA	tls	381	60	SW 8082
2,4,5,6-TCMX (Surr)	68.0	%	11/07/1998	NA	tls	381	60	SW 8082

NET NATIONAL ENVIRONMENTAL TESTING, INC.

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Rockford, IL 61109
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(800) 807-2877

ANALYTICAL REPORT

Mr. Wei-Lin Feng
ENSR
740 Pasquinelli Drive
Westmont, IL 60559

11/11/1998

Sample No. : 500403

NET Job No.: 98.13995

Sample Description: B18 (1-3)
ComEd-Waukegan; 1801-023-610

Date Taken: 10/27/1998
Time Taken: 14:50
IEPA Cert. No. 100221

Date Received: 10/29/1998
Time Received: 10:30
WDNR Cert. No. 999447130

Parameter	Results	Units	Date of Analysis	Method PQL	Analyst	Batch No. Prep/Run	Analytical Method
pH, Non-Aqueous	7.24	units	11/06/1998	0.10	nwg	195	SW 9045B
Solids, Total	87.9	%	11/04/1998	0.1	aks	2527	SM 2540
Arsenic, GFAA	6.9	mg/kg dw	11/07/1998	0.57	mhp	238 673	SW 7060
Barium, ICP	739	mg/kg dw	11/10/1998	1.1	kdw	1171 2194	SW 6010B
Cadmium, ICP	1.5	mg/kg dw	11/09/1998	0.57	kdw	1171 2178	SW 6010B
Chromium, ICP	9.8	mg/kg dw	11/09/1998	2.3	kdw	1171 2163	SW 6010B
Lead, ICP	24	mg/kg dw	11/09/1998	4.6	kdw	1171 2401	SW 6010B
Mercury, CVAA	0.093	mg/kg dw	11/06/1998	0.046	sep	666 770	SW 7471A
Selenium, GFAA	<0.28	mg/kg dw	11/08/1998	0.28	jtt	238 562	SW 7740
Silver, AA	<2.3	mg/kg dw	11/06/1998	2.3	sep	495 572	SW 7760
UST VOLATILES NON-AQUEOUS							
Benzene	<0.006	mg/kg dw	11/06/1998	0.006	jap	78	SW 8260A
Ethylbenzene	<0.006	mg/kg dw	11/06/1998	0.006	jap	78	SW 8260A
Toluene	<0.006	mg/kg dw	11/06/1998	0.006	jap	78	SW 8260A
Xylenes, Total	<0.006	mg/kg dw	11/06/1998	0.006	jap	78	SW 8260A
Dibromofluoromethane (Surr)	82.2	%	11/06/1998	81-129	jap	78	SW 8260A
Toluene-d8 (Surr)	85.8	%	11/06/1998	74-129	jap	78	SW 8260A
4-Bromofluoromethane (Surr)	92.6	%	11/06/1998	70-130	jap	78	SW 8260A
Prep, 8310 PNAs NON-AQUEOUS	extracted		11/03/1998		mmv	768	SW 3540C
PNA CMPDS - 8310 NONAQUEOUS	ELV						
Acenaphthene	<0.1	mg/kg dw	11/07/1998	0.023	keh	768 1832	SW 8310
Acenaphthylene	<0.1	mg/kg dw	11/07/1998	0.023	keh	768 1832	SW 8310
Anthracene	<0.27	mg/kg dw	11/07/1998	0.046	keh	768 1832	SW 8310
Benzo(a)anthracene	<0.77	mg/kg dw	11/07/1998	0.0030	keh	768 1832	SW 8310
Benzo(b)fluoranthene	0.24	mg/kg dw	11/07/1998	0.0041	keh	768 1832	SW 8310

ELV : Elevated reporting limits due to matrix interference.

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ANALYTICAL REPORT

Mr. Wei-Lin Feng
ENSR
740 Pasquinelli Drive
Westmont, IL 60559

11/11/1998

Sample No. : 500403

NET Job No.: 98.13995

Sample Description: B18 (1-3)
ComEd-Waukegan; 1801-023-610

Date Taken: 10/27/1998
Time Taken: 14:50
IEPA Cert. No. 100221

Date Received: 10/29/1998
Time Received: 10:30
WDNR Cert. No. 999447130

Parameter	Results	Units	Date of Analysis	Method PQL	Analyst	Batch No. Prep/Run		Analytical Method
Benzo(k)fluoranthene	<0.42	mg/kg dw	11/07/1998	0.0039	keh	768	1832	SW 8310
Benzo(a)pyrene	0.28	mg/kg dw	11/07/1998	0.0052	keh	768	1832	SW 8310
Benzo(ghi)perylene	0.26	mg/kg dw	11/07/1998	0.046	keh	768	1832	SW 8310
Chrysene	0.36	mg/kg dw	11/07/1998	0.03	keh	768	1832	SW 8310
Dibenzo(a,h)anthracene	<0.064	mg/kg dw	11/07/1998	0.007	keh	768	1832	SW 8310
Fluoranthene	<0.49	mg/kg dw	11/07/1998	0.023	keh	768	1832	SW 8310
Fluorene	<0.1	mg/kg dw	11/07/1998	0.023	keh	768	1832	SW 8310
Indeno(1,2,3-cd)pyrene	0.081	mg/kg dw	11/07/1998	0.0098	keh	768	1832	SW 8310
Naphthalene	0.73	mg/kg dw	11/07/1998	0.028	keh	768	1832	SW 8310
Phenanthrene	0.86	mg/kg dw	11/07/1998	0.046	keh	768	1832	SW 8310
Pyrene	0.56	mg/kg dw	11/07/1998	0.023	keh	768	1832	SW 8310
Surr: p-Terphenyl	Masked		11/07/1998	43-125	keh	768	1832	SW 8310
PCB Non-Aqueous Extraction	COMPLETE		11/04/1998	COMPLETE	mmv	381		SW 3540C
PCB'S NON-AQUEOUS								
PCB-1016	<0.046	mg/kg dw	11/07/1998	0.046	tls	381	60	SW 8082
PCB-1221	<0.046	mg/kg dw	11/07/1998	0.046	tls	381	60	SW 8082
PCB-1232	<0.046	mg/kg dw	11/07/1998	0.046	tls	381	60	SW 8082
PCB-1242	<0.046	mg/kg dw	11/07/1998	0.046	tls	381	60	SW 8082
PCB-1248	<0.046	mg/kg dw	11/07/1998	0.046	tls	381	60	SW 8082
PCB-1254	<0.046	mg/kg dw	11/07/1998	0.046	tls	381	60	SW 8082
PCB-1260	<0.046	mg/kg dw	11/07/1998	0.046	tls	381	60	SW 8082
Decachlorobiphenyl (Surr)	77.0	%	11/07/1998	NA	tls	381	60	SW 8082
2,4,5,6-TCMX (Surr)	85.0	%	11/07/1998	NA	tls	381	60	SW 8082

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ANALYTICAL REPORT

Mr. Wei-Lin Feng
ENSR
740 Pasquinelli Drive
Westmont, IL 60559

11/11/1998

Sample No. : 500404

NET Job No.: 98.13995

Sample Description: S15
ComEd-Waukegan; 1801-023-610

Date Taken: 10/28/1998
Time Taken: 07:40
IEPA Cert. No. 100221

Date Received: 10/29/1998
Time Received: 10:30
WDNR Cert. No. 999447130

Parameter	Results	Units	Date of Analysis	Method PQL	Analyst	Batch No. Prep/Run	Analytical Method
pH, Non-Aqueous	7.08	units	11/06/1998	0.10	nwg	195	SW 9045B
Solids, Total	76.6	%	11/04/1998	0.1	aks	2527	SM 2540
Arsenic, GFAA	3.3	mg/kg dw	11/07/1998	0.65	mhp	238 673	SW 7060
Barium, ICP	470	mg/kg dw	11/09/1998	1.3	kdw	1172 2194	SW 6010B
Cadmium, ICP	1.4	mg/kg dw	11/09/1998	0.65	kdw	1172 2178	SW 6010B
Chromium, ICP	12	mg/kg dw	11/09/1998	2.6	kdw	1172 2163	SW 6010B
Lead, ICP	42	mg/kg dw	11/09/1998	5.2	kdw	1172 2401	SW 6010B
Mercury, CVAA	0.056	mg/kg dw	11/06/1998	0.052	sep	666 770	SW 7471A
Selenium, GFAA	0.38	mg/kg dw	11/08/1998	0.33	jtt	238 562	SW 7740
Silver, AA	<2.6	mg/kg dw	11/06/1998	2.6	sep	495 572	SW 7760
Prep, TPH 8015M - NONAQUEOUS	extracted		11/02/1998		wna	245	SW 8015M
TPH MODIFIED 8015							
TPH as Gas	<653	mg/kg dw	11/04/1998	65	out	245 491	SW 8015M
TPH as Diesel	87,600 PT	mg/kg dw	11/04/1998	65	out	245 491	SW 8015M
TPH as Oil	<653	mg/kg dw	11/04/1998	65	out	245 491	SW 8015M
N-octacosane (TPH surr)	Diluted out	mg/kg dw	11/04/1998		out	245 491	SW 8015M
UST VOLATILES NON-AQUEOUS							
Benzene	<0.007	mg/kg dw	11/06/1998	0.007	jap	77	SW 8260A
Ethylbenzene	<0.007	mg/kg dw	11/06/1998	0.007	jap	77	SW 8260A
Toluene	<0.007	mg/kg dw	11/06/1998	0.007	jap	77	SW 8260A
Xylenes, Total	<0.007	mg/kg dw	11/06/1998	0.007	jap	77	SW 8260A
Dibromofluoromethane (Surr)	87.2	%	11/06/1998	81-129	jap	77	SW 8260A
Toluene-d8 (Surr)	90.2	%	11/06/1998	74-129	jap	77	SW 8260A
4-Bromofluoromethane (Surr)	100.0	%	11/06/1998	70-130	jap	77	SW 8260A
Prep, 8310 PNAs NON-AQUEOUS	extracted		11/03/1998		mmv	768	SW 3540C

PT : Pattern does not match the calibration standard; however, hydrocarbons are present in the diesel range.

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ANALYTICAL REPORT

Mr. Wei-Lin Feng
ENSR
740 Pasquinelli Drive
Westmont, IL 60559

11/11/1998

Sample No. : 500404

NET Job No.: 98.13995

Sample Description: S15
ComEd-Waukegan; 1801-023-610

Date Taken: 10/28/1998
Time Taken: 07:40
IEPA Cert. No. 100221

Date Received: 10/29/1998
Time Received: 10:30
WDNR Cert. No. 999447130

Parameter	Results	Units	Date of Analysis	Method PQL	Analyst	Batch No. Prep/Run		Analytical Method
PNA CMPDS - 8310 NONAQUEOUS	ELV							
Acenaphthene	<8.7	mg/kg dw	11/07/1998	0.026	keh	768	1832	SW 8310
Acenaphthylene	<25	mg/kg dw	11/07/1998	0.026	keh	768	1832	SW 8310
Anthracene	<100	mg/kg dw	11/07/1998	0.052	keh	768	1832	SW 8310
Benzo(a)anthracene	<21	mg/kg dw	11/07/1998	0.0034	keh	768	1832	SW 8310
Benzo(b)fluoranthene	<5.0	mg/kg dw	11/07/1998	0.0047	keh	768	1832	SW 8310
Benzo(k)fluoranthene	<1.1	mg/kg dw	11/07/1998	0.0044	keh	768	1832	SW 8310
Benzo(a)pyrene	<0.54	mg/kg dw	11/07/1998	0.0060	keh	768	1832	SW 8310
Benzo(ghi)perylene	<4.7	mg/kg dw	11/07/1998	0.052	keh	768	1832	SW 8310
Chrysene	<6.7	mg/kg dw	11/07/1998	0.04	keh	768	1832	SW 8310
Dibenzo(a,h)anthracene	<0.7	mg/kg dw	11/07/1998	0.008	keh	768	1832	SW 8310
Fluoranthene	<89	mg/kg dw	11/07/1998	0.026	keh	768	1832	SW 8310
Fluorene	65	mg/kg dw	11/07/1998	0.026	keh	768	1832	SW 8310
Indeno(1,2,3-cd)pyrene	<0.99	mg/kg dw	11/07/1998	0.011	keh	768	1832	SW 8310
Naphthalene	<34	mg/kg dw	11/07/1998	0.033	keh	768	1832	SW 8310
Phenanthrene	<72	mg/kg dw	11/07/1998	0.052	keh	768	1832	SW 8310
Pyrene	<157	mg/kg dw	11/07/1998	0.026	keh	768	1832	SW 8310
Surr: p-Terphenyl	Diluted out		11/07/1998	43-125	keh	768	1832	SW 8310
PCB Non-Aqueous Extraction	COMPLETE		11/04/1998	COMPLETE	mmv	381		SW 3540C
PCB'S NON-AQUEOUS	ELV							
PCB-1016	<0.3	mg/kg dw	11/07/1998	0.052	tls	381	60	SW 8082
PCB-1221	<0.3	mg/kg dw	11/07/1998	0.052	tls	381	60	SW 8082
PCB-1232	<0.3	mg/kg dw	11/07/1998	0.052	tls	381	60	SW 8082
PCB-1242	<0.3	mg/kg dw	11/07/1998	0.052	tls	381	60	SW 8082
PCB-1248	<0.3	mg/kg dw	11/07/1998	0.052	tls	381	60	SW 8082
PCB-1254	<0.3	mg/kg dw	11/07/1998	0.052	tls	381	60	SW 8082

ELV : Elevated reporting limits due to matrix interference.

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ANALYTICAL REPORT

Mr. Wei-Lin Feng
ENSR
740 Pasquinelli Drive
Westmont, IL 60559

11/11/1998

Sample No. : 500404

NET Job No.: 98.13995

Sample Description: S15
ComEd-Waukegan; 1801-023-610

Date Taken: 10/28/1998
Time Taken: 07:40
IEPA Cert. No. 100221

Date Received: 10/29/1998
Time Received: 10:30
WDNR Cert. No. 999447130

Parameter	Results	Units	Date of Analysis	Method PQL	Analyst	Batch No. Prep/Run		Analytical Method
PCB-1260	<0.3	mg/kg dw	11/07/1998	0.052	tls	381	60	SW 8082
Decachlorobiphenyl (Surr)	101.0	%	11/07/1998	NA	tls	381	60	SW 8082
2,4,5,6-TCMX (Surr)	54.0	%	11/07/1998	NA	tls	381	60	SW 8082

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ANALYTICAL REPORT

Mr. Wei-Lin Feng
ENSR
740 Pasquinelli Drive
Westmont, IL 60559

11/11/1998

Sample No. : 500405

NET Job No.: 98.13995

Sample Description: S14
ComEd-Waukegan; 1801-023-610

Date Taken: 10/28/1998
Time Taken: 07:45
IEPA Cert. No. 100221

Date Received: 10/29/1998
Time Received: 10:30
WDNR Cert. No. 999447130

Parameter	Results		Units	Date of Analysis	Method PQL	Analyst	Batch No. Prep/Run		Analytical Method
pH, Non-Aqueous	7.75		units	11/06/1998	0.10	nwg		195	SW 9045B
Solids, Total	79.4		%	11/04/1998	0.1	aks		2527	SM 2540
Arsenic, GFAA	5.3		mg/kg dw	11/07/1998	0.63	mhp	238	673	SW 7060
Barium, ICP	605		mg/kg dw	11/09/1998	1.3	kdw	1172	2194	SW 6010B
Cadmium, ICP	<1.2	MX	mg/kg dw	11/09/1998	0.63	kdw	1172	2178	SW 6010B
Chromium, ICP	26		mg/kg dw	11/09/1998	2.5	kdw	1172	2163	SW 6010B
Lead, ICP	26		mg/kg dw	11/09/1998	5.0	kdw	1172	2401	SW 6010B
Mercury, CVAA	0.087		mg/kg dw	11/06/1998	0.050	sep	666	770	SW 7471A
Selenium, GFAA	2.4		mg/kg dw	11/08/1998	0.31	jtt	238	562	SW 7740
Silver, AA	<2.5		mg/kg dw	11/06/1998	2.5	sep	495	572	SW 7760
Prep, TPH 8015M - NONAQUEOUS	extracted			11/02/1998		wna	245		SW 8015M
TPH MODIFIED 8015									
TPH as Gas	<63		mg/kg dw	11/04/1998	63	out	245	491	SW 8015M
TPH as Diesel	<63		mg/kg dw	11/04/1998	63	out	245	491	SW 8015M
TPH as Oil	2,240	PT	mg/kg dw	11/04/1998	63	out	245	491	SW 8015M
N-octacosane (TPH surr)	78.0		%	11/04/1998		out	245	491	SW 8015M
UST VOLATILES NON-AQUEOUS									
Benzene	<0.006		mg/kg dw	11/06/1998	0.006	jap		77	SW 8260A
Ethylbenzene	<0.006		mg/kg dw	11/06/1998	0.006	jap		77	SW 8260A
Toluene	<0.006		mg/kg dw	11/06/1998	0.006	jap		77	SW 8260A
Xylenes, Total	<0.006		mg/kg dw	11/06/1998	0.006	jap		77	SW 8260A
Dibromofluoromethane (Surr)	89.4		%	11/06/1998	81-129	jap		77	SW 8260A
Toluene-d8 (Surr)	85.4		%	11/06/1998	74-129	jap		77	SW 8260A
4-Bromofluoromethane (Surr)	84.0		%	11/06/1998	70-130	jap		77	SW 8260A
Prep, 8310 PNAs NON-AQUEOUS	extracted			11/03/1998		mmv	768		SW 3540C

MX : Dilution required due to sample matrix; analyte is not detected.
PT : Pattern does not match the calibration standard; however, hydrocarbons are present in the oil range.

NATIONAL ENVIRONMENTAL TESTING, INC.

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ANALYTICAL REPORT

Mr. Wei-Lin Feng
ENSR
740 Pasquinelli Drive
Westmont, IL 60559

11/11/1998

Sample No. : 500405

NET Job No.: 98.13995

Sample Description: S14
ComEd-Waukegan; 1801-023-610

Date Taken: 10/28/1998
Time Taken: 07:45
IEPA Cert. No. 100221

Date Received: 10/29/1998
Time Received: 10:30
WDNR Cert. No. 999447130

Parameter	Results	Units	Date of Analysis	Method PQL	Analyst	Batch No. Prep/Run		Analytical Method
PNA CMPDS - 8310 NONAQUEOUS	ELV							
Acenaphthene	<1.0	mg/kg dw	11/07/1998	0.025	keh	768	1832	SW 8310
Acenaphthylene	<1.0	mg/kg dw	11/07/1998	0.025	keh	768	1832	SW 8310
Anthracene	<2.0	mg/kg dw	11/07/1998	0.050	keh	768	1832	SW 8310
Benzo(a)anthracene	<9.6	mg/kg dw	11/07/1998	0.0033	keh	768	1832	SW 8310
Benzo(b)fluoranthene	<0.67	mg/kg dw	11/07/1998	0.0045	keh	768	1832	SW 8310
Benzo(k)fluoranthene	<1.2	mg/kg dw	11/07/1998	0.0043	keh	768	1832	SW 8310
Benzo(a)pyrene	<1.1	mg/kg dw	11/07/1998	0.0058	keh	768	1832	SW 8310
Benzo(ghi)perylene	<2.0	mg/kg dw	11/07/1998	0.050	keh	768	1832	SW 8310
Chrysene	<2	mg/kg dw	11/07/1998	0.04	keh	768	1832	SW 8310
Dibenzo(a,h)anthracene	<0.92	mg/kg dw	11/07/1998	0.008	keh	768	1832	SW 8310
Fluoranthene	<1.6	mg/kg dw	11/07/1998	0.025	keh	768	1832	SW 8310
Fluorene	<1.0	mg/kg dw	11/07/1998	0.025	keh	768	1832	SW 8310
Indeno(1,2,3-cd)pyrene	<0.44	mg/kg dw	11/07/1998	0.011	keh	768	1832	SW 8310
Naphthalene	<1.2	mg/kg dw	11/07/1998	0.031	keh	768	1832	SW 8310
Phenanthrene	<2.0	mg/kg dw	11/07/1998	0.050	keh	768	1832	SW 8310
Pyrene	<1.6	mg/kg dw	11/07/1998	0.025	keh	768	1832	SW 8310
Surr: p-Terphenyl	Diluted out		11/07/1998	43-125	keh	768	1832	SW 8310
PCB Non-Aqueous Extraction	COMPLETE		11/04/1998	COMPLETE	mmv	381		SW 3540C
PCB'S NON-AQUEOUS								
PCB-1016	<0.050	mg/kg dw	11/07/1998	0.050	tls	381	60	SW 8082
PCB-1221	<0.050	mg/kg dw	11/07/1998	0.050	tls	381	60	SW 8082
PCB-1232	<0.050	mg/kg dw	11/07/1998	0.050	tls	381	60	SW 8082
PCB-1242	<0.050	mg/kg dw	11/07/1998	0.050	tls	381	60	SW 8082
PCB-1248	<0.050	mg/kg dw	11/07/1998	0.050	tls	381	60	SW 8082
PCB-1254	<0.050	mg/kg dw	11/07/1998	0.050	tls	381	60	SW 8082

ELV : Elevated reporting limits due to matrix interference.

MWG13-15_45954
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NET® NATIONAL ENVIRONMENTAL TESTING, INC.

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ANALYTICAL REPORT

Mr. Wei-Lin Feng
ENSR
740 Pasquinelli Drive
Westmont, IL 60559

11/11/1998

Sample No. : 500405

NET Job No.: 98.13995

Sample Description: S14
ComEd-Waukegan; 1801-023-610

Date Taken: 10/28/1998
Time Taken: 07:45
IEPA Cert. No. 100221

Date Received: 10/29/1998
Time Received: 10:30
WDNR Cert. No. 999447130

Parameter	Results	Units	Date of Analysis	Method PQL	Analyst	Batch No. Prep/Run	Analytical Method
PCB-1260	<0.050	mg/kg dw	11/07/1998	0.050	tls	381 60	SW 8082
Decachlorobiphenyl (Surr)	80.0	%	11/07/1998	NA	tls	381 60	SW 8082
2,4,5,6-TCMX (Surr)	68.0	%	11/07/1998	NA	tls	381 60	SW 8082

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ANALYTICAL REPORT

Mr. Wei-Lin Feng
ENSR
740 Pasquinelli Drive
Westmont, IL 60559

11/11/1998

Sample No. : 500406

NET Job No.: 98.13995

Sample Description: S13
ComEd-Waukegan; 1801-023-610

Date Taken: 10/28/1998
Time Taken: 07:50
IEPA Cert. No. 100221

Date Received: 10/29/1998
Time Received: 10:30
WDNR Cert. No. 999447130

Parameter	Results		Units	Date of Analysis	Method PQL	Analyst	Batch No. Prep/Run		Analytical Method
pH, Non-Aqueous	7.44		units	11/06/1998	0.10	nwg		196	SW 9045B
Solids, Total	77.0		%	11/04/1998	0.1	aks		2527	SM 2540
Arsenic, GFAA	3.9		mg/kg dw	11/07/1998	0.65	mhp	238	673	SW 7060
Barium, ICP	377		mg/kg dw	11/09/1998	1.3	kdw	1172	2194	SW 6010B
Cadmium, ICP	<1.3	MX	mg/kg dw	11/09/1998	0.65	kdw	1172	2178	SW 6010B
Chromium, ICP	18		mg/kg dw	11/09/1998	2.6	kdw	1172	2163	SW 6010B
Lead, ICP	18		mg/kg dw	11/09/1998	5.2	kdw	1172	2401	SW 6010B
Mercury, CVAA	<0.052		mg/kg dw	11/06/1998	0.052	sep	666	770	SW 7471A
Selenium, GFAA	0.34		mg/kg dw	11/08/1998	0.32	jtt	238	562	SW 7740
Silver, AA	<2.6		mg/kg dw	11/06/1998	2.6	sep	495	572	SW 7760
Prep, TPH 8015M - NONAQUEOUS	extracted			11/02/1998		wna	245		SW 8015M
TPH MODIFIED 8015									
TPH as Gas	<65		mg/kg dw	11/04/1998	65	out	245	491	SW 8015M
TPH as Diesel	<65		mg/kg dw	11/04/1998	65	out	245	491	SW 8015M
TPH as Oil	11,200	PT	mg/kg dw	11/04/1998	65	out	245	491	SW 8015M
N-octacosane (TPH surr)	64.0		%	11/04/1998		out	245	491	SW 8015M
UST VOLATILES NON-AQUEOUS									
Benzene	<0.006		mg/kg dw	11/06/1998	0.006	jap		77	SW 8260A
Ethylbenzene	<0.006		mg/kg dw	11/06/1998	0.006	jap		77	SW 8260A
Toluene	<0.006		mg/kg dw	11/06/1998	0.006	jap		77	SW 8260A
Xylenes, Total	<0.006		mg/kg dw	11/06/1998	0.006	jap		77	SW 8260A
Dibromofluoromethane (Surr)	88.0		%	11/06/1998	81-129	jap		77	SW 8260A
Toluene-d8 (Surr)	88.4		%	11/06/1998	74-129	jap		77	SW 8260A
4-Bromofluoromethane (Surr)	99.2		%	11/06/1998	70-130	jap		77	SW 8260A
Prep, 8310 PNAs NON-AQUEOUS	extracted			11/03/1998		mmv	768		SW 3540C

MX : Dilution required due to sample matrix; analyte is not detected.
PT : Pattern does not match the calibration standard; however, hydrocarbons are present in the oil range.

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ANALYTICAL REPORT

Mr. Wei-Lin Feng
ENSR
740 Pasquinelli Drive
Westmont, IL 60559

11/11/1998

Sample No. : 500406

NET Job No.: 98.13995

Sample Description: S13
ComEd-Waukegan; 1801-023-610

Date Taken: 10/28/1998
Time Taken: 07:50
IEPA Cert. No. 100221

Date Received: 10/29/1998
Time Received: 10:30
WDNR Cert. No. 999447130

Parameter	Results	Units	Date of Analysis	Method PQL	Analyst	Batch No. Prep/Run		Analytical Method
PNA CMPDS - 8310 NONAQUEOUS	ELV							
Acenaphthene	<2.6	mg/kg dw	11/07/1998	0.026	keh	768	1832	SW 8310
Acenaphthylene	<2.6	mg/kg dw	11/07/1998	0.026	keh	768	1832	SW 8310
Anthracene	<5.2	mg/kg dw	11/07/1998	0.052	keh	768	1832	SW 8310
Benzo(a)anthracene	<8.1	mg/kg dw	11/07/1998	0.0034	keh	768	1832	SW 8310
Benzo(b)fluoranthene	<1.7	mg/kg dw	11/07/1998	0.0047	keh	768	1832	SW 8310
Benzo(k)fluoranthene	<32	mg/kg dw	11/07/1998	0.0044	keh	768	1832	SW 8310
Benzo(a)pyrene	<0.79	mg/kg dw	11/07/1998	0.0060	keh	768	1832	SW 8310
Benzo(ghi)perylene	<5.2	mg/kg dw	11/07/1998	0.052	keh	768	1832	SW 8310
Chrysene	<4	mg/kg dw	11/07/1998	0.04	keh	768	1832	SW 8310
Dibenzo(a,h)anthracene	<0.8	mg/kg dw	11/07/1998	0.008	keh	768	1832	SW 8310
Fluoranthene	<2.6	mg/kg dw	11/07/1998	0.026	keh	768	1832	SW 8310
Fluorene	<2.6	mg/kg dw	11/07/1998	0.026	keh	768	1832	SW 8310
Indeno(1,2,3-cd)pyrene	<1.1	mg/kg dw	11/07/1998	0.011	keh	768	1832	SW 8310
Naphthalene	<3.2	mg/kg dw	11/07/1998	0.032	keh	768	1832	SW 8310
Phenanthrene	<5.2	mg/kg dw	11/07/1998	0.052	keh	768	1832	SW 8310
Pyrene	<2.6	mg/kg dw	11/07/1998	0.026	keh	768	1832	SW 8310
Surr: p-Terphenyl	Diluted out		11/07/1998	43-125	keh	768	1832	SW 8310
PCB Non-Aqueous Extraction	COMPLETE		11/04/1998	COMPLETE	mmv	381		SW 3540C
PCB'S NON-AQUEOUS								
PCB-1016	<0.052	mg/kg dw	11/07/1998	0.052	tls	381	60	SW 8082
PCB-1221	<0.052	mg/kg dw	11/11/1998	0.052	tls	381	62	SW 8082
PCB-1232	<0.052	mg/kg dw	11/07/1998	0.052	tls	381	60	SW 8082
PCB-1242	<0.052	mg/kg dw	11/07/1998	0.052	tls	381	60	SW 8082
PCB-1248	<0.052	mg/kg dw	11/07/1998	0.052	tls	381	60	SW 8082
PCB-1254	<0.052	mg/kg dw	11/07/1998	0.052	tls	381	60	SW 8082

ELV : Elevated reporting limits due to matrix interference.

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ANALYTICAL REPORT

Mr. Wei-Lin Feng
ENSR
740 Pasquinelli Drive
Westmont, IL 60559

11/11/1998

Sample No. : 500406

NET Job No.: 98.13995

Sample Description: S13
ComEd-Waukegan; 1801-023-610

Date Taken: 10/28/1998
Time Taken: 07:50
IEPA Cert. No. 100221

Date Received: 10/29/1998
Time Received: 10:30
WDNR Cert. No. 999447130

Parameter	Results	Units	Date of Analysis	Method PQL	Analyst	Batch No. Prep/Run	Analytical Method
PCB-1260	<0.052	mg/kg dw	11/07/1998	0.052	tls	381 60	SW 8082
Decachlorobiphenyl (Surr)	Masked	%	11/07/1998	NA	tls	381 60	SW 8082
2,4,5,6-TCMX (Surr)	71.0	%	11/07/1998	NA	tls	381 60	SW 8082

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ANALYTICAL REPORT

Mr. Wei-Lin Feng
ENSR
740 Pasquinelli Drive
Westmont, IL 60559

11/11/1998

Sample No. : 500407

NET Job No.: 98.13995

Sample Description: B12 (1-3)
ComEd-Waukegan; 1801-023-610

Date Taken: 10/28/1998
Time Taken: 08:35
IEPA Cert. No. 100221

Date Received: 10/29/1998
Time Received: 10:30
WDNR Cert. No. 999447130

Parameter	Results		Units	Date of Analysis	Method PQL	Analyst	Batch No. Prep/Run		Analytical Method
pH, Non-Aqueous	7.01		units	11/06/1998	0.10	nwg		196	SW 9045B
Solids, Total	84.4		%	11/04/1998	0.1	aks		2527	SM 2540
Arsenic, GFAA	7.6		mg/kg dw	11/07/1998	0.59	mhp	238	673	SW 7060
Barium, ICP	509		mg/kg dw	11/10/1998	1.2	kdw	1172	2194	SW 6010B
Cadmium, ICP	1.4		mg/kg dw	11/09/1998	0.59	kdw	1172	2178	SW 6010B
Chromium, ICP	154		mg/kg dw	11/09/1998	2.4	kdw	1172	2163	SW 6010B
Lead, ICP	77		mg/kg dw	11/09/1998	4.7	kdw	1172	2401	SW 6010B
Mercury, CVAA	<0.047		mg/kg dw	11/06/1998	0.047	sep	666	770	SW 7471A
Selenium, GFAA	0.43		mg/kg dw	11/08/1998	0.30	jtt	238	562	SW 7740
Silver, AA	<2.4		mg/kg dw	11/06/1998	2.4	sep	495	572	SW 7760
UST VOLATILES NON-AQUEOUS									
Benzene	<0.006		mg/kg dw	11/06/1998	0.006	jap		77	SW 8260A
Ethylbenzene	<0.006		mg/kg dw	11/06/1998	0.006	jap		77	SW 8260A
Toluene	<0.006		mg/kg dw	11/06/1998	0.006	jap		77	SW 8260A
Xylenes, Total	<0.006		mg/kg dw	11/06/1998	0.006	jap		77	SW 8260A
Dibromofluoromethane (Surr)	107.0		%	11/06/1998	81-129	jap		77	SW 8260A
Toluene-d8 (Surr)	94.8		%	11/06/1998	74-129	jap		77	SW 8260A
4-Bromofluoromethane (Surr)	79.2		%	11/06/1998	70-130	jap		77	SW 8260A
Prep, 8310 PNAs NON-AQUEOUS	extracted			11/03/1998		mmv	768		SW 3540C
PNA CMPDS - 8310 NONAQUEOUS									
Acenaphthene	<0.024		mg/kg dw	11/07/1998	0.024	keh	768	1832	SW 8310
Acenaphthylene	<0.024		mg/kg dw	11/07/1998	0.024	keh	768	1832	SW 8310
Anthracene	<0.047		mg/kg dw	11/07/1998	0.047	keh	768	1832	SW 8310
Benzo(a)anthracene	<0.017	MX	mg/kg dw	11/07/1998	0.0031	keh	768	1832	SW 8310
Benzo(b)fluoranthene	0.0098		mg/kg dw	11/07/1998	0.0043	keh	768	1832	SW 8310

MX : Dilution required due to sample matrix; analyte is not detected.

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ANALYTICAL REPORT

Mr. Wei-Lin Feng
ENSR
740 Pasquinelli Drive
Westmont, IL 60559

11/11/1998

Sample No. : 500407

NET Job No.: 98.13995

Sample Description: B12 (1-3)
ComEd-Waukegan; 1801-023-610

Date Taken: 10/28/1998
Time Taken: 08:35
IEPA Cert. No. 100221

Date Received: 10/29/1998
Time Received: 10:30
WDNR Cert. No. 999447130

Parameter	Results		Units	Date of Analysis	Method PQL	Analyst	Batch No. Prep/Run		Analytical Method
Benzo(k)fluoranthene	0.0059		mg/kg dw	11/07/1998	0.0040	keh	768	1832	SW 8310
Benzo(a)pyrene	0.013		mg/kg dw	11/07/1998	0.0055	keh	768	1832	SW 8310
Benzo(ghi)perylene	<0.047		mg/kg dw	11/07/1998	0.047	keh	768	1832	SW 8310
Chrysene	<0.04		mg/kg dw	11/07/1998	0.04	keh	768	1832	SW 8310
Dibenzo(a,h)anthracene	<0.007		mg/kg dw	11/07/1998	0.007	keh	768	1832	SW 8310
Fluoranthene	<0.045	MX	mg/kg dw	11/07/1998	0.024	keh	768	1832	SW 8310
Fluorene	<0.024		mg/kg dw	11/07/1998	0.024	keh	768	1832	SW 8310
Indeno(1,2,3-cd)pyrene	<0.010		mg/kg dw	11/07/1998	0.010	keh	768	1832	SW 8310
Naphthalene	0.11		mg/kg dw	11/07/1998	0.030	keh	768	1832	SW 8310
Phenanthrene	0.073		mg/kg dw	11/07/1998	0.047	keh	768	1832	SW 8310
Pyrene	<0.024		mg/kg dw	11/07/1998	0.024	keh	768	1832	SW 8310
Surr: p-Terphenyl	106.2		%	11/07/1998	43-125	keh	768	1832	SW 8310
PCB Non-Aqueous Extraction	COMPLETE			11/04/1998	COMPLETE	mmv	381		SW 3540C
PCB'S NON-AQUEOUS									
PCB-1016	<0.047		mg/kg dw	11/07/1998	0.047	tls	381	60	SW 8082
PCB-1221	<0.047		mg/kg dw	11/07/1998	0.047	tls	381	60	SW 8082
PCB-1232	<0.047		mg/kg dw	11/07/1998	0.047	tls	381	60	SW 8082
PCB-1242	<0.047		mg/kg dw	11/07/1998	0.047	tls	381	60	SW 8082
PCB-1248	<0.047		mg/kg dw	11/07/1998	0.047	tls	381	60	SW 8082
PCB-1254	<0.047		mg/kg dw	11/07/1998	0.047	tls	381	60	SW 8082
PCB-1260	<0.047		mg/kg dw	11/07/1998	0.047	tls	381	60	SW 8082
Decachlorobiphenyl (Surr)	67.0		%	11/07/1998	NA	tls	381	60	SW 8082
2,4,5,6-TCMX (Surr)	83.0		%	11/07/1998	NA	tls	381	60	SW 8082

MX : Dilution required due to sample matrix; analyte is not detected.

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ANALYTICAL REPORT

Mr. Wei-Lin Feng
ENSR
740 Pasquinelli Drive
Westmont, IL 60559

11/11/1998

Sample No. : 500408

NET Job No.: 98.13995

Sample Description: S9
ComEd-Waukegan; 1801-023-610

Date Taken: 10/28/1998
Time Taken: 09:45
IEPA Cert. No. 100221

Date Received: 10/29/1998
Time Received: 10:30
WDNR Cert. No. 999447130

Parameter	Results	Units	Date of Analysis	Method PQL	Analyst	Batch No. Prep/Run	Analytical Method
pH, Non-Aqueous	7.61	units	11/06/1998	0.10	nwg	196	SW 9045B
Solids, Total	85.6	%	11/04/1998	0.1	aks	2527	SM 2540
Arsenic, GFAA	9.8	mg/kg dw	11/07/1998	0.58	mhp	238 673	SW 7060
Barium, ICP	152	mg/kg dw	11/10/1998	1.2	kdw	1172 2194	SW 6010B
Cadmium, ICP	11	mg/kg dw	11/09/1998	0.58	kdw	1172 2178	SW 6010B
Chromium, ICP	16	mg/kg dw	11/09/1998	2.3	kdw	1172 2163	SW 6010B
Lead, ICP	49	mg/kg dw	11/09/1998	4.7	kdw	1172 2401	SW 6010B
Mercury, CVAA	0.41	mg/kg dw	11/06/1998	0.047	sep	666 770	SW 7471A
Selenium, GFAA	0.42	mg/kg dw	11/08/1998	0.29	jtt	238 562	SW 7740
Silver, AA	<2.3	mg/kg dw	11/06/1998	2.3	sep	495 572	SW 7760
Prep, TPH 8015M - NONAQUEOUS	extracted		11/02/1998		wna	245	SW 8015M
TPH MODIFIED 8015							
TPH as Gas	<234	mg/kg dw	11/04/1998	58	out	245 491	SW 8015M
TPH as Diesel	<234	mg/kg dw	11/04/1998	58	out	245 491	SW 8015M
TPH as Oil	12,500 PT	mg/kg dw	11/04/1998	58	out	245 491	SW 8015M
N-octacosane (TPH surr)	Diluted out	mg/kg dw	11/04/1998		out	245 491	SW 8015M
UST VOLATILES NON-AQUEOUS							
Benzene	<0.006	mg/kg dw	11/06/1998	0.006	jap	77	SW 8260A
Ethylbenzene	<0.006	mg/kg dw	11/06/1998	0.006	jap	77	SW 8260A
Toluene	<0.006	mg/kg dw	11/06/1998	0.006	jap	77	SW 8260A
Xylenes, Total	<0.006	mg/kg dw	11/06/1998	0.006	jap	77	SW 8260A
Dibromofluoromethane (Surr)	96.2	%	11/06/1998	81-129	jap	77	SW 8260A
Toluene-d8 (Surr)	82.2	%	11/06/1998	74-129	jap	77	SW 8260A
4-Bromofluoromethane (Surr)	94.4	%	11/06/1998	70-130	jap	77	SW 8260A
Prep, 8310 PNAs NON-AQUEOUS	extracted		11/03/1998		mmv	768	SW 3540C

PT : Pattern does not match the calibration standard; however, hydrocarbons are present in the oil range.

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ANALYTICAL REPORT

Mr. Wei-Lin Feng
ENSR
740 Pasquinelli Drive
Westmont, IL 60559

11/11/1998

Sample No. : 500408

NET Job No.: 98.13995

Sample Description: S9
ComEd-Waukegan; 1801-023-610

Date Taken: 10/28/1998
Time Taken: 09:45
IEPA Cert. No. 100221

Date Received: 10/29/1998
Time Received: 10:30
WDNR Cert. No. 999447130

Parameter	Results	Units	Date of Analysis	Method PQL	Analyst	Batch No. Prep/Run		Analytical Method
PNA CMPDS - 8310 NONAQUEOUS	ELV							
Acenaphthene	<0.92	mg/kg dw	11/07/1998	0.023	keh	768	1832	SW 8310
Acenaphthylene	<0.92	mg/kg dw	11/07/1998	0.023	keh	768	1832	SW 8310
Anthracene	<1.9	mg/kg dw	11/07/1998	0.047	keh	768	1832	SW 8310
Benzo(a)anthracene	<0.67	mg/kg dw	11/07/1998	0.0030	keh	768	1832	SW 8310
Benzo(b)fluoranthene	<0.28	mg/kg dw	11/07/1998	0.0042	keh	768	1832	SW 8310
Benzo(k)fluoranthene	<0.23	mg/kg dw	11/07/1998	0.0040	keh	768	1832	SW 8310
Benzo(a)pyrene	<0.22	mg/kg dw	11/07/1998	0.0054	keh	768	1832	SW 8310
Benzo(ghi)perylene	<1.9	mg/kg dw	11/07/1998	0.047	keh	768	1832	SW 8310
Chrysene	<2	mg/kg dw	11/07/1998	0.04	keh	768	1832	SW 8310
Dibenzo(a,h)anthracene	<0.3	mg/kg dw	11/07/1998	0.007	keh	768	1832	SW 8310
Fluoranthene	<0.92	mg/kg dw	11/07/1998	0.023	keh	768	1832	SW 8310
Fluorene	<0.92	mg/kg dw	11/07/1998	0.023	keh	768	1832	SW 8310
Indeno(1,2,3-cd)pyrene	<0.40	mg/kg dw	11/07/1998	0.010	keh	768	1832	SW 8310
Naphthalene	<1.2	mg/kg dw	11/07/1998	0.029	keh	768	1832	SW 8310
Phenanthrene	<1.9	mg/kg dw	11/07/1998	0.047	keh	768	1832	SW 8310
Pyrene	<0.92	mg/kg dw	11/07/1998	0.023	keh	768	1832	SW 8310
Surr: p-Terphenyl	Diluted out		11/07/1998	43-125	keh	768	1832	SW 8310
PCB Non-Aqueous Extraction	COMPLETE		11/04/1998	COMPLETE	mmv	381		SW 3540C
PCB'S NON-AQUEOUS								
PCB-1016	<0.047	mg/kg dw	11/07/1998	0.047	tls	381	60	SW 8082
PCB-1221	<0.047	mg/kg dw	11/07/1998	0.047	tls	381	60	SW 8082
PCB-1232	<0.047	mg/kg dw	11/07/1998	0.047	tls	381	60	SW 8082
PCB-1242	<0.047	mg/kg dw	11/07/1998	0.047	tls	381	60	SW 8082
PCB-1248	<0.047	mg/kg dw	11/07/1998	0.047	tls	381	60	SW 8082
PCB-1254	<0.047	mg/kg dw	11/07/1998	0.047	tls	381	60	SW 8082

ELV : Elevated reporting limits due to matrix interference.

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ANALYTICAL REPORT

Mr. Wei-Lin Feng
ENSR
740 Pasquinelli Drive
Westmont, IL 60559

11/11/1998

Sample No. : 500408

NET Job No.: 98.13995

Sample Description: S9
ComEd-Waukegan; 1801-023-610

Date Taken: 10/28/1998
Time Taken: 09:45
IEPA Cert. No. 100221

Date Received: 10/29/1998
Time Received: 10:30
WDNR Cert. No. 999447130

Parameter	Results	Units	Date of Analysis	Method PQL	Analyst	Batch No. Prep/Run		Analytical Method
PCB-1260	<0.047	mg/kg dw	11/07/1998	0.047	tls	381	60	SW 8082
Decachlorobiphenyl (Surr)	Masked	%	11/07/1998	NA	tls	381	60	SW 8082
2,4,5,6-TCMX (Surr)	79.0	%	11/07/1998	NA	tls	381	60	SW 8082

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ANALYTICAL REPORT

Mr. Wei-Lin Feng
ENSR
740 Pasquinelli Drive
Westmont, IL 60559

11/11/1998

Sample No. : 500409

NET Job No.: 98.13995

Sample Description: S8
ComEd-Waukegan; 1801-023-610

Date Taken: 10/28/1998
Time Taken: 11:10
IEPA Cert. No. 100221

Date Received: 10/29/1998
Time Received: 10:30
WDNR Cert. No. 999447130

Parameter	Results	Units	Date of Analysis	Method PQL	Analyst	Batch No. Prep/Run	Analytical Method
pH, Non-Aqueous	6.20	units	11/06/1998	0.10	nwg	196	SW 9045B
Solids, Total	86.1	%	11/04/1998	0.1	aks	2527	SM 2540
Arsenic, GFAA	10	mg/kg dw	11/07/1998	0.58	mhp	238 673	SW 7060
Barium, ICP	139	mg/kg dw	11/10/1998	1.2	kdw	1172 2194	SW 6010B
Cadmium, ICP	6.0	mg/kg dw	11/09/1998	0.58	kdw	1172 2178	SW 6010B
Chromium, ICP	39	mg/kg dw	11/09/1998	2.3	kdw	1172 2163	SW 6010B
Lead, ICP	139	mg/kg dw	11/09/1998	4.6	kdw	1172 2401	SW 6010B
Mercury, CVAA	0.11	mg/kg dw	11/06/1998	0.046	sep	666 770	SW 7471A
Selenium, GFAA	2.2	mg/kg dw	11/08/1998	0.29	jtt	238 562	SW 7740
Silver, AA	<2.3	mg/kg dw	11/06/1998	2.3	sep	495 572	SW 7760
Prep, TPH 8015M - NONAQUEOUS	extracted		11/02/1998		wna	245	SW 8015M
TPH MODIFIED 8015							
TPH as Gas	<1,160	mg/kg dw	11/04/1998	58	out	245 491	SW 8015M
TPH as Diesel	<1,160	mg/kg dw	11/04/1998	58	out	245 491	SW 8015M
TPH as Oil	283,000 PT	mg/kg dw	11/04/1998	58	out	245 491	SW 8015M
N-octacosane (TPH surr)	Diluted out	mg/kg dw	11/04/1998		out	245 491	SW 8015M
UST VOLATILES NON-AQUEOUS							
Benzene	<0.006	mg/kg dw	11/06/1998	0.006	jap	77	SW 8260A
Ethylbenzene	<0.006	mg/kg dw	11/06/1998	0.006	jap	77	SW 8260A
Toluene	<0.006	mg/kg dw	11/06/1998	0.006	jap	77	SW 8260A
Xylenes, Total	<0.006	mg/kg dw	11/06/1998	0.006	jap	77	SW 8260A
Dibromofluoromethane (Surr)	92.2	%	11/06/1998	81-129	jap	77	SW 8260A
Toluene-d8 (Surr)	86.2	%	11/06/1998	74-129	jap	77	SW 8260A
4-Bromofluoromethane (Surr)	96.8	%	11/06/1998	70-130	jap	77	SW 8260A
Prep, 8310 PNAs NON-AQUEOUS	extracted		11/03/1998		mmv	768	SW 3540C

PT : Pattern does not match the calibration standard; however, hydrocarbons are present in the oil range.

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ANALYTICAL REPORT

Mr. Wei-Lin Feng
ENSR
740 Pasquinelli Drive
Westmont, IL 60559

11/11/1998

Sample No. : 500409

NET Job No.: 98.13995

Sample Description: S8
ComEd-Waukegan; 1801-023-610

Date Taken: 10/28/1998
Time Taken: 11:10
IEPA Cert. No. 100221

Date Received: 10/29/1998
Time Received: 10:30
WDNR Cert. No. 999447130

Parameter	Results	Units	Date of Analysis	Method PQL	Analyst	Batch No. Prep/Run		Analytical Method
PNA CMPDS - 8310 NONAQUEOUS	ELV							
Acenaphthene	<3.4	mg/kg dw	11/07/1998	0.023	keh	768	1832	SW 8310
Acenaphthylene	<3.4	mg/kg dw	11/07/1998	0.023	keh	768	1832	SW 8310
Anthracene	<6.9	mg/kg dw	11/07/1998	0.046	keh	768	1832	SW 8310
Benzo(a)anthracene	<3.9	mg/kg dw	11/07/1998	0.0030	keh	768	1832	SW 8310
Benzo(b)fluoranthene	<0.63	mg/kg dw	11/07/1998	0.0042	keh	768	1832	SW 8310
Benzo(k)fluoranthene	<0.58	mg/kg dw	11/07/1998	0.0039	keh	768	1832	SW 8310
Benzo(a)pyrene	<0.80	mg/kg dw	11/07/1998	0.0053	keh	768	1832	SW 8310
Benzo(ghi)perylene	<6.9	mg/kg dw	11/07/1998	0.046	keh	768	1832	SW 8310
Chrysene	<4	mg/kg dw	11/07/1998	0.03	keh	768	1832	SW 8310
Dibenzo(a,h)anthracene	<1	mg/kg dw	11/07/1998	0.007	keh	768	1832	SW 8310
Fluoranthene	<3.4	mg/kg dw	11/07/1998	0.023	keh	768	1832	SW 8310
Fluorene	<3.4	mg/kg dw	11/07/1998	0.023	keh	768	1832	SW 8310
Indeno(1,2,3-cd)pyrene	<1.5	mg/kg dw	11/07/1998	0.010	keh	768	1832	SW 8310
Naphthalene	<4.4	mg/kg dw	11/07/1998	0.029	keh	768	1832	SW 8310
Phenanthrene	<6.9	mg/kg dw	11/07/1998	0.046	keh	768	1832	SW 8310
Pyrene	<3.4	mg/kg dw	11/07/1998	0.023	keh	768	1832	SW 8310
Surr: p-Terphenyl	Diluted out		11/07/1998	43-125	keh	768	1832	SW 8310
PCB Non-Aqueous Extraction	COMPLETE		11/04/1998	COMPLETE	mmv	381		SW 3540C
PCB'S NON-AQUEOUS	ELV							
PCB-1016	<0.46	mg/kg dw	11/07/1998	0.046	tls	381	60	SW 8082
PCB-1221	<0.46	mg/kg dw	11/07/1998	0.046	tls	381	60	SW 8082
PCB-1232	<0.46	mg/kg dw	11/07/1998	0.046	tls	381	60	SW 8082
PCB-1242	<0.46	mg/kg dw	11/07/1998	0.046	tls	381	60	SW 8082
PCB-1248	<0.46	mg/kg dw	11/07/1998	0.046	tls	381	60	SW 8082
PCB-1254	<0.46	mg/kg dw	11/07/1998	0.046	tls	381	60	SW 8082

ELV : Elevated reporting limits due to matrix interference.

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ANALYTICAL REPORT

Mr. Wei-Lin Feng
ENSR
740 Pasquinelli Drive
Westmont, IL 60559

11/11/1998

Sample No. : 500409

NET Job No.: 98.13995

Sample Description: S8
ComEd-Waukegan; 1801-023-610

Date Taken: 10/28/1998
Time Taken: 11:10
IEPA Cert. No. 100221

Date Received: 10/29/1998
Time Received: 10:30
WDNR Cert. No. 999447130

Parameter	Results	Units	Date of Analysis	Method PQL	Analyst	Batch No. Prep/Run	Analytical Method
PCB-1260	<0.46	mg/kg dw	11/07/1998	0.046	tls	381 60	SW 8082
Decachlorobiphenyl (Surr)	38.0	%	11/07/1998	NA	tls	381 60	SW 8082
2,4,5,6-TCMX (Surr)	72.0	%	11/07/1998	NA	tls	381 60	SW 8082

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QUALITY CONTROL REPORT

CONTINUING CALIBRATION VERIFICATION

ENSR
740 Pasquinelli Drive
Westmont, IL 60559

Mr. Wei-Lin Feng

11/11/1998

NET Job Number: 98.13995

Analyte	Run Batch Number	CCV True Conc.	Conc. Found	Percent Recovery
pH, Non-Aqueous	195	7.00	7.00	100.0
pH, Non-Aqueous	196	7.00	7.00	100.0
Arsenic, GFAA	673	0.0250	0.0242	96.8
Barium, ICP	2194	2.00	2.07	103.5
Cadmium, ICP	2178	1.00	0.996	99.6
Chromium, ICP	2163	2.00	2.00	100.0
Lead, ICP	2393	2.00	1.91	95.5
Lead, ICP	2401	2.00	2.02	101.0
Mercury, CVAA	770	0.0025	0.00230	92.0
Mercury, CVAA	772	0.0025	0.00253	101.2
Selenium, GFAA	562	0.050	0.0506	101.2
Selenium, GFAA	562	0.050	0.0501	100.2
Silver, AA	570	0.50	0.515	103.0
Silver, AA	572	0.50	0.495	99.0
UST VOLATILES NON-AQUEOUS				
Benzene	76	50.0	51.2	102.4
Ethylbenzene	76	50.0	49.2	98.4
Toluene	76	50.0	49.3	98.6
Xylenes, Total	76	150	146	97.3
UST VOLATILES NON-AQUEOUS				
Benzene	77	50.0	53.6	107.2
Ethylbenzene	77	50.0	53.3	106.6
Toluene	77	50.0	55.2	110.4
Xylenes, Total	77	150	161	107.3
UST VOLATILES NON-AQUEOUS				
Benzene	78	50.0	54.7	109.4
Ethylbenzene	78	50.0	53.1	106.2
Toluene	78	50.0	54.9	109.8
Xylenes, Total	78	150	160	106.7
PNA CMPDS - 8310 NONAQUEOUS				
Acenaphthene	1832	5000	4,588	91.8
Acenaphthylene	1832	5000	5,060	101.2
Anthracene	1832	5000	5,107	102.1
Benzo(a)anthracene	1832	5000	4,951	99.0

CCV - Continuing Calibration Verification

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QUALITY CONTROL REPORT

CONTINUING CALIBRATION VERIFICATION

ENSR
740 Pasquinelli Drive
Westmont, IL 60559

Mr. Wei-Lin Feng

11/11/1998

NET Job Number: 98.13995

Analyte	Run Batch Number	CCV True Conc.	Conc. Found	Percent Recovery
Benzo(b)fluoranthene	1832	5000	4,844	96.9
Benzo(k)fluoranthene	1832	5000	4,953	99.1
Benzo(a)pyrene	1832	5000	5,003	100.1
Benzo(ghi)perylene	1832	5000	4,921	98.4
Chrysene	1832	5000	4,987	99.7
Dibenzo(a,h)anthracene	1832	5000	4,928	98.6
Fluoranthene	1832	5000	4,849	97.0
Fluorene	1832	5000	4,885	97.7
Indeno(1,2,3-cd)pyrene	1832	5000	4,576	91.5
Naphthalene	1832	5000	4,627	92.5
Phenanthrene	1832	5000	4,659	93.2
Pyrene	1832	5000	4,999	100.0
Surr: p-Terphenyl	1832	5000	4,813	96.3
PNA CMPDS - 8310 NONAQUEOUS				
Acenaphthene	1832	5000	4,598	92.0
Acenaphthylene	1832	5000	5,091	101.8
Anthracene	1832	5000	5,062	101.2
Benzo(a)anthracene	1832	5000	5,051	101.0
Benzo(b)fluoranthene	1832	5000	5,000	100.0
Benzo(k)fluoranthene	1832	5000	4,806	96.1
Benzo(a)pyrene	1832	5000	4,961	99.2
Benzo(ghi)perylene	1832	5000	4,943	98.9
Chrysene	1832	5000	4,972	99.4
Dibenzo(a,h)anthracene	1832	5000	4,977	99.5
Fluoranthene	1832	5000	4,889	97.8
Fluorene	1832	5000	4,901	98.0
Indeno(1,2,3-cd)pyrene	1832	5000	4,606	92.1
Naphthalene	1832	5000	4,695	93.9
Phenanthrene	1832	5000	4,694	93.9
Pyrene	1832	5000	5,064	101.3
Surr: p-Terphenyl	1832	5000	4,886	97.7
PNA CMPDS - 8310 NONAQUEOUS				
Acenaphthene	1832	5000	4,477	89.5
Acenaphthylene	1832	5000	5,062	101.2

CCV - Continuing Calibration Verification

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QUALITY CONTROL REPORT

CONTINUING CALIBRATION VERIFICATION

ENSR
740 Pasquinelli Drive
Westmont, IL 60559

Mr. Wei-Lin Feng

11/11/1998

NET Job Number: 98.13995

Analyte	Run Batch Number	CCV True Conc.	Conc. Found	Percent Recovery
Anthracene	1832	5000	5,092	101.8
Benzo(a)anthracene	1832	5000	4,930	98.6
Benzo(b)fluoranthene	1832	5000	5,289	105.8
Benzo(k)fluoranthene	1832	5000	4,828	96.6
Benzo(a)pyrene	1832	5000	4,949	99.0
Benzo(ghi)perylene	1832	5000	4,915	98.3
Chrysene	1832	5000	4,915	98.3
Dibenzo(a,h)anthracene	1832	5000	5,003	100.1
Fluoranthene	1832	5000	4,952	99.0
Fluorene	1832	5000	4,884	97.7
Indeno(1,2,3-cd)pyrene	1832	5000	4,783	95.7
Naphthalene	1832	5000	4,808	96.2
Phenanthrene	1832	5000	4,712	94.2
Pyrene	1832	5000	5,124	102.5
Surr: p-Terphenyl	1832	5000	4,756	95.1
PNA CMPDS - 8310 NONAQUEOUS				
Acenaphthene	1832	5000	4,696	93.9
Acenaphthylene	1832	5000	5,096	101.9
Anthracene	1832	5000	5,039	100.8
Benzo(a)anthracene	1832	5000	5,158	103.2
Benzo(b)fluoranthene	1832	5000	5,085	101.7
Benzo(k)fluoranthene	1832	5000	4,840	96.8
Benzo(a)pyrene	1832	5000	4,881	97.6
Benzo(ghi)perylene	1832	5000	4,897	97.9
Chrysene	1832	5000	5,027	100.5
Dibenzo(a,h)anthracene	1832	5000	4,974	99.5
Fluoranthene	1832	5000	4,931	98.6
Fluorene	1832	5000	4,888	97.8
Indeno(1,2,3-cd)pyrene	1832	5000	4,557	91.1
Naphthalene	1832	5000	4,702	94.0
Phenanthrene	1832	5000	4,767	95.3
Pyrene	1832	5000	5,159	103.2
Surr: p-Terphenyl	1832	5000	4,914	98.3
PCB'S NON-AQUEOUS				

CCV - Continuing Calibration Verification

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QUALITY CONTROL REPORT

CONTINUING CALIBRATION VERIFICATION

ENSR
740 Pasquinelli Drive
Westmont, IL 60559

11/11/1998

NET Job Number: 98.13995

Mr. Wei-Lin Feng

Analyte	Run Batch Number	CCV True Conc.	Conc. Found	Percent Recovery
PCB-1016	60	500	489	97.8
PCB-1260	60	500	490	98.0
PCB'S NON-AQUEOUS				
PCB-1016	60	500	500	100.0
PCB-1260	60	500	479	95.8
PCB'S NON-AQUEOUS				
PCB-1016	60	500	498	99.6
PCB-1016	60	500	498	99.6
PCB-1260	60	500	457	91.4
PCB-1260	60	500	457	91.4
PCB'S NON-AQUEOUS				
PCB'S NON-AQUEOUS				
PCB'S NON-AQUEOUS				

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QUALITY CONTROL REPORT

BLANK ANALYSIS

ENSR
740 Pasquinelli Drive
Westmont, IL 60559

Mr. Wei-Lin Feng

11/11/1998

NET Job Number: 98.13995

Analyte	Prep Batch Number	Run Batch Number	Blank Analysis Results	Units	Reporting Limit	Analytical Method
Arsenic, GFAA	237	671	<0.50	mg/Kg	0.50	SW 7060
Arsenic, GFAA	238	673	<0.50	mg/Kg	0.50	SW 7060
Barium, ICP	1171	2194	<1.0	mg/Kg	1.0	SW 6010B
Barium, ICP	1172	2194	<1.0	mg/Kg	1.0	SW 6010B
Cadmium, ICP	1171	2178	<0.50	mg/Kg	0.50	SW 6010B
Cadmium, ICP	1172	2178	<0.50	mg/Kg	0.50	SW 6010B
Chromium, ICP	1171	2163	<2.0	mg/Kg	2.0	SW 6010B
Chromium, ICP	1172	2163	<2.0	mg/Kg	2.0	SW 6010B
Lead, ICP	1171	2393	<4.0	mg/Kg	4.0	SW 6010B
Lead, ICP	1172	2401	<4.0	mg/Kg	4.0	SW 6010B
Mercury, CVAA	666	770	<0.040	mg/Kg	0.040	SW 7471A
Mercury, CVAA	668	772	<0.040	mg/Kg	0.040	SW 7471A
Selenium, GFAA	237	559	<0.25	mg/Kg	0.25	SW 7740
Selenium, GFAA	238	562	<0.25	mg/Kg	0.25	SW 7740
Silver, AA	493	570	<2.0	mg/Kg	2.0	SW 7760
Silver, AA	495	572	<2.0	mg/Kg	2.0	SW 7760
UST VOLATILES NON-AQUEOUS						SW 8260A
Benzene		76	<0.005	mg/Kg	0.005	SW 8260A
Ethylbenzene		76	<0.005	mg/Kg	0.005	SW 8260A
Toluene		76	<0.005	mg/Kg	0.005	SW 8260A
Xylenes, Total		76	<0.005	mg/Kg	0.005	SW 8260A
Dibromofluoromethane (Surr)		76	85.8	%	81-129	SW 8260A
Toluene-d8 (Surr)		76	95.6	%	74-129	SW 8260A
4-Bromofluoromethane (Surr)		76	103.0	%	70-130	SW 8260A
UST VOLATILES NON-AQUEOUS						SW 8260A
Benzene		77	<0.005	mg/Kg	0.005	SW 8260A
Ethylbenzene		77	<0.005	mg/Kg	0.005	SW 8260A
Toluene		77	<0.005	mg/Kg	0.005	SW 8260A
Xylenes, Total		77	<0.005	mg/Kg	0.005	SW 8260A

Advisory Control Limits for Blanks:

All compounds should be less than the Reporting Limit, except for phthalate esters, toluene, methylene chloride, acetone and chloroform should be less than 5 times the Reporting Limit.

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QUALITY CONTROL REPORT

BLANK ANALYSIS

ENSR
740 Pasquinelli Drive
Westmont, IL 60559

Mr. Wei-Lin Feng

11/11/1998

NET Job Number: 98.13995

Analyte	Prep Batch Number	Run Batch Number	Blank Analysis Results	Units	Reporting Limit	Analytical Method
Dibromofluoromethane (Surr)		77	101.4	%	81-129	SW 8260A
Toluene-d8 (Surr)		77	106.4	%	74-129	SW 8260A
4-Bromofluoromethane (Surr)		77	113.4	%	70-130	SW 8260A
UST VOLATILES NON-AQUEOUS						SW 8260A
Benzene		78	<0.005	mg/Kg	0.005	SW 8260A
Ethylbenzene		78	<0.005	mg/Kg	0.005	SW 8260A
Toluene		78	<0.005	mg/Kg	0.005	SW 8260A
Xylenes, Total		78	<0.005	mg/Kg	0.005	SW 8260A
Dibromofluoromethane (Surr)		78	98.0	%	81-129	SW 8260A
Toluene-d8 (Surr)		78	107.4	%	74-129	SW 8260A
4-Bromofluoromethane (Surr)		78	111.2	%	70-130	SW 8260A
PNA CMPDS - 8310 NONAQUEOUS						SW 8310
Acenaphthene	767	1826	<0.020	mg/Kg	0.020	SW 8310
Acenaphthylene	767	1826	<0.020	mg/Kg	0.020	SW 8310
Anthracene	767	1826	<0.040	mg/Kg	0.040	SW 8310
Benzo(a)anthracene	767	1826	<0.0026	mg/Kg	0.0026	SW 8310
Benzo(b)fluoranthene	767	1826	<0.0036	mg/Kg	0.0036	SW 8310
Benzo(k)fluoranthene	767	1826	<0.0034	mg/Kg	0.0034	SW 8310
Benzo(a)pyrene	767	1826	<0.0046	mg/Kg	0.0046	SW 8310
Benzo(ghi)perylene	767	1826	<0.040	mg/Kg	0.040	SW 8310
Chrysene	767	1826	<0.03	mg/Kg	0.03	SW 8310
Dibenzo(a,h)anthracene	767	1826	<0.006	mg/Kg	0.006	SW 8310
Fluoranthene	767	1826	<0.020	mg/Kg	0.020	SW 8310
Fluorene	767	1826	<0.020	mg/Kg	0.020	SW 8310
Indeno(1,2,3-cd)pyrene	767	1826	<0.0086	mg/Kg	0.0086	SW 8310
Naphthalene	767	1826	<0.025	mg/Kg	0.025	SW 8310
Phenanthrene	767	1826	<0.040	mg/Kg	0.040	SW 8310
Pyrene	767	1826	<0.020	mg/Kg	0.020	SW 8310
Surr: p-Terphenyl	767	1826	86.2	%	43-125	SW 8310

Advisory Control Limits for Blanks:

All compounds should be less than the Reporting Limit, except for phthalate esters, toluene, methylene chloride, acetone and chloroform should be less than 5 times the Reporting Limit.

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QUALITY CONTROL REPORT

BLANK ANALYSIS

ENSR
740 Pasquinelli Drive
Westmont, IL 60559

11/11/1998

NET Job Number: 98.13995

Mr. Wei-Lin Feng

Analyte	Prep Batch Number	Run Batch Number	Blank Analysis Results	Units	Reporting Limit	Analytical Method
PNA CMPDS - 8310 NONAQUEOUS						SW 8310
Acenaphthene	767	1830	<0.020	mg/Kg	0.020	SW 8310
Acenaphthylene	767	1830	<0.020	mg/Kg	0.020	SW 8310
Anthracene	767	1830	<0.040	mg/Kg	0.040	SW 8310
Benzo(a)anthracene	767	1830	<0.0026	mg/Kg	0.0026	SW 8310
Benzo(b)fluoranthene	767	1830	<0.0036	mg/Kg	0.0036	SW 8310
Benzo(k)fluoranthene	767	1830	<0.0034	mg/Kg	0.0034	SW 8310
Benzo(a)pyrene	767	1830	<0.0046	mg/Kg	0.0046	SW 8310
Benzo(ghi)perylene	767	1830	<0.040	mg/Kg	0.040	SW 8310
Chrysene	767	1830	<0.03	mg/Kg	0.03	SW 8310
Dibenzo(a,h)anthracene	767	1830	<0.006	mg/Kg	0.006	SW 8310
Fluoranthene	767	1830	<0.020	mg/Kg	0.020	SW 8310
Fluorene	767	1830	<0.020	mg/Kg	0.020	SW 8310
Indeno(1,2,3-cd)pyrene	767	1830	<0.0086	mg/Kg	0.0086	SW 8310
Naphthalene	767	1830	<0.025	mg/Kg	0.025	SW 8310
Phenanthrene	767	1830	<0.040	mg/Kg	0.040	SW 8310
Pyrene	767	1830	<0.020	mg/Kg	0.020	SW 8310
Surr: p-Terphenyl	767	1830	90.3	%	43-125	SW 8310
PNA CMPDS - 8310 NONAQUEOUS						SW 8310
Acenaphthene	768	1832	<0.020	mg/Kg	0.020	SW 8310
Acenaphthylene	768	1832	<0.020	mg/Kg	0.020	SW 8310
Anthracene	768	1832	<0.040	mg/Kg	0.040	SW 8310
Benzo(a)anthracene	768	1832	<0.0026	mg/Kg	0.0026	SW 8310
Benzo(b)fluoranthene	768	1832	<0.0036	mg/Kg	0.0036	SW 8310
Benzo(k)fluoranthene	768	1832	<0.0034	mg/Kg	0.0034	SW 8310
Benzo(a)pyrene	768	1832	<0.0046	mg/Kg	0.0046	SW 8310
Benzo(ghi)perylene	768	1832	<0.040	mg/Kg	0.040	SW 8310
Chrysene	768	1832	<0.03	mg/Kg	0.03	SW 8310
Dibenzo(a,h)anthracene	768	1832	<0.006	mg/Kg	0.006	SW 8310

Advisory Control Limits for Blanks:

All compounds should be less than the Reporting Limit, except for phthalate esters, toluene, methylene chloride, acetone and chloroform should be less than 5 times the Reporting Limit.

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QUALITY CONTROL REPORT

BLANK ANALYSIS

ENSR
740 Pasquinelli Drive
Westmont, IL 60559

Mr. Wei-Lin Feng

11/11/1998

NET Job Number: 98.13995

Analyte	Prep Batch Number	Run Batch Number	Blank Analysis Results	Units	Reporting Limit	Analytical Method
Fluoranthene	768	1832	<0.020	mg/Kg	0.020	SW 8310
Fluorene	768	1832	<0.020	mg/Kg	0.020	SW 8310
Indeno(1,2,3-cd)pyrene	768	1832	<0.0086	mg/Kg	0.0086	SW 8310
Naphthalene	768	1832	<0.025	mg/Kg	0.025	SW 8310
Phenanthrene	768	1832	<0.040	mg/Kg	0.040	SW 8310
Pyrene	768	1832	<0.020	mg/Kg	0.020	SW 8310
Surr: p-Terphenyl	768	1832	77.3	%	43-125	SW 8310
PNA CMPDS - 8310 NONAQUEOUS						SW 8310
Acenaphthene	769	1832	<0.020	mg/Kg	0.020	SW 8310
Acenaphthylene	769	1832	<0.020	mg/Kg	0.020	SW 8310
Anthracene	769	1832	<0.040	mg/Kg	0.040	SW 8310
Benzo(a)anthracene	769	1832	<0.0026	mg/Kg	0.0026	SW 8310
Benzo(b)fluoranthene	769	1832	<0.0036	mg/Kg	0.0036	SW 8310
Benzo(k)fluoranthene	769	1832	<0.0034	mg/Kg	0.0034	SW 8310
Benzo(a)pyrene	769	1832	<0.0046	mg/Kg	0.0046	SW 8310
Benzo(ghi)perylene	769	1832	<0.040	mg/Kg	0.040	SW 8310
Chrysene	769	1832	<0.03	mg/Kg	0.03	SW 8310
Dibenzo(a,h)anthracene	769	1832	<0.006	mg/Kg	0.006	SW 8310
Fluoranthene	769	1832	<0.020	mg/Kg	0.020	SW 8310
Fluorene	769	1832	<0.020	mg/Kg	0.020	SW 8310
Indeno(1,2,3-cd)pyrene	769	1832	<0.0086	mg/Kg	0.0086	SW 8310
Naphthalene	769	1832	<0.025	mg/Kg	0.025	SW 8310
Phenanthrene	769	1832	<0.040	mg/Kg	0.040	SW 8310
Pyrene	769	1832	<0.020	mg/Kg	0.020	SW 8310
Surr: p-Terphenyl	769	1832	78.0	%	43-125	SW 8310
PCB'S NON-AQUEOUS						SW 8082
PCB-1016	381	53	<0.040	mg/Kg	0.040	SW 8082
PCB-1221	381	53	<0.040	mg/Kg	0.040	SW 8082
PCB-1232	381	53	<0.040	mg/Kg	0.040	SW 8082

Advisory Control Limits for Blanks:

All compounds should be less than the Reporting Limit, except for phthalate esters, toluene, methylene chloride, acetone and chloroform should be less than 5 times the Reporting Limit.

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QUALITY CONTROL REPORT

BLANK ANALYSIS

ENSR
740 Pasquinelli Drive
Westmont, IL 60559

Mr. Wei-Lin Feng

11/11/1998

NET Job Number: 98.13995

Analyte	Prep Batch Number	Run Batch Number	Blank Analysis Results	Units	Reporting Limit	Analytical Method
PCB-1242	381	53	<0.040	mg/Kg	0.040	SW 8082
PCB-1248	381	53	<0.040	mg/Kg	0.040	SW 8082
PCB-1254	381	53	<0.040	mg/Kg	0.040	SW 8082
PCB-1260	381	53	<0.040	mg/Kg	0.040	SW 8082
Decachlorobiphenyl (Surr)	381	53	84.0	%	NA	SW 8082
2,4,5,6-TCMX (Surr)	381	53	67.0	%	NA	SW 8082

Advisory Control Limits for Blanks:

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QUALITY CONTROL REPORT

LABORATORY CONTROL STANDARD

ENSR
740 Pasquinelli Drive
Westmont, IL 60559

11/11/1998

NET Job Number: 98.13995

Mr. Wei-Lin Feng

Analyte	Prep Batch Number	Run Batch Number	True Conc.	Conc. Found	LCS % Recovery
Arsenic, GFAA	237	671	0.500	0.465	93.0
Arsenic, GFAA	238	673	0.0100	0.0117	117.0
Barium, ICP	1171	2194	5.00	5.09	101.8
Barium, ICP	1172	2194	5.00	5.18	103.6
Cadmium, ICP	1171	2178	2.50	2.72	108.8
Cadmium, ICP	1172	2178	2.50	2.71	108.4
Chromium, ICP	1171	2163	5.00	5.20	104.0
Chromium, ICP	1172	2163	5.00	5.80	116.0
Lead, ICP	1171	2393	5.00	5.20	104.0
Lead, ICP	1172	2401	5.00	5.80	116.0
Mercury, CVAA	666	770	0.0025	0.00248	99.2
Mercury, CVAA		770	0.0020	0.00165	82.5
Mercury, CVAA	668	772	0.0025	0.00275	110.0
Mercury, CVAA		772	0.0020	0.00204	102.0
Selenium, GFAA	237	559	0.50	0.43	86.0
Selenium, GFAA	238	562	0.50	0.60	120.0
Silver, AA	493	570	1.0	0.958	95.8
Silver, AA		570	0.10	0.095	95.0
Silver, AA	495	572	0.10	0.103	103.0
TPH MODIFIED 8015					
TPH as Gas	245	486	250	225	90.0
TPH as Diesel	245	486	250	216	86.4
TPH as Oil	245	486	250	201	80.4
N-octacosane (TPH surr)	245	486	100	117	117.0
UST VOLATILES NON-AQUEOUS					
Benzene		76	20.0	21.3	106.5
Ethylbenzene		76	20.0	20.7	103.5
Toluene		76	20.0	20.0	100.0
Xylenes, Total		76	60.0	61.4	102.3
Dibromofluoromethane (Surr)		76	50.0	49.2	98.4
Toluene-d8 (Surr)		76	50.0	53.8	107.6

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QUALITY CONTROL REPORT

LABORATORY CONTROL STANDARD

ENSR
740 Pasquinelli Drive
Westmont, IL 60559

11/11/1998

NET Job Number: 98.13995

Mr. Wei-Lin Feng

Analyte	Prep Batch Number	Run Batch Number	True Conc.	Conc. Found	LCS % Recovery
4-Bromofluoromethane (Surr)		76	50.0	55.1	110.2
UST VOLATILES NON-AQUEOUS					
Benzene		77	20.0	21.8	109.0
Ethylbenzene		77	20.0	21.8	109.0
Toluene		77	20.0	20.8	104.0
Xylenes, Total		77	60.0	63.4	105.7
Dibromofluoromethane (Surr)		77	50.0	50.2	100.4
Toluene-d8 (Surr)		77	50.0	52.0	104.0
4-Bromofluoromethane (Surr)		77	50.0	56.5	113.0
UST VOLATILES NON-AQUEOUS					
Benzene		78	20.0	21.0	105.0
Ethylbenzene		78	20.0	20.7	103.5
Toluene		78	20.0	20 1	100.5
Xylenes, Total		78	60.0	61.6	102.7
Dibromofluoromethane (Surr)		78	50.0	48.1	96.2
Toluene-d8 (Surr)		78	50.0	51.4	102.8
4-Bromofluoromethane (Surr)		78	50.0	55.2	110.4
PNA CMPDS - 8310 NONAQUEOUS					
Acenaphthene	767	1828	0.033	0.027	81.8
Acenaphthylene	767	1828	0.033	0.028	84.8
Anthracene	767	1828	0.033	0.029	87.9
Benzo(a)anthracene	767	1828	0.033	0.027	81.8
Benzo(b)fluoranthene	767	1828	0.033	0.027	81.8
Benzo(k)fluoranthene	767	1828	0.033	0.028	84.8
Benzo(a)pyrene	767	1828	0.033	0.027	81.8
Benzo(ghi)perylene	767	1828	0.033	0.030	90.9
Chrysene	767	1828	0.033	0.029	87.9
Dibenzo(a,h)anthracene	767	1828	0.033	0.028	84.8
Fluoranthene	767	1828	0.033	0.029	87.9
Fluorene	767	1828	0.033	0.031	93.9
Indeno(1,2,3-cd)pyrene	767	1828	0.033	0.028	84.8

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QUALITY CONTROL REPORT

LABORATORY CONTROL STANDARD

ENSR
740 Pasquinelli Drive
Westmont, IL 60559

11/11/1998

NET Job Number: 98.13995

Mr. Wei-Lin Feng

Analyte	Prep Batch Number	Run Batch Number	True Conc.	Conc. Found	LCS % Recovery
Naphthalene	767	1828	0.033	0.031	93.9
Phenanthrene	767	1828	0.033	0.029	87.9
Pyrene	767	1828	0.033	0.033	100.0
Surr: p-Terphenyl	767	1828	2000	1,613	80.7
PNA CMPDS - 8310 NONAQUEOUS					
Acenaphthene	767	1830	0.033	0.032	97.0
Acenaphthylene	767	1830	0.033	0.030	90.9
Anthracene	767	1830	0.033	0.030	90.9
Benzo(a)anthracene	767	1830	0.033	0.031	93.9
Benzo(b)fluoranthene	767	1830	0.033	0.033	100.0
Benzo(k)fluoranthene	767	1830	0.033	0.029	87.9
Benzo(a)pyrene	767	1830	0.033	0.027	81.8
Benzo(ghi)perylene	767	1830	0.033	0.029	87.9
Chrysene	767	1830	0.033	0.031	93.9
Dibenzo(a,h)anthracene	767	1830	0.033	0.029	87.9
Fluoranthene	767	1830	0.033	0.032	97.0
Fluorene	767	1830	0.033	0.029	87.9
Indeno(1,2,3-cd)pyrene	767	1830	0.033	0.030	90.9
Naphthalene	767	1830	0.033	0.023	69.7
Phenanthrene	767	1830	0.033	0.030	90.9
Pyrene	767	1830	0.033	0.031	93.9
Surr: p-Terphenyl	767	1830	2000	1,705	85.3
PNA CMPDS - 8310 NONAQUEOUS					
Acenaphthene	768	1832	0.033	0.028	84.8
Acenaphthylene	768	1832	0.033	0.029	87.9
Anthracene	768	1832	0.033	0.030	90.9
Benzo(a)anthracene	768	1832	0.033	0.031	93.9
Benzo(b)fluoranthene	768	1832	0.033	0.028	84.8
Benzo(k)fluoranthene	768	1832	0.033	0.028	84.8
Benzo(a)pyrene	768	1832	0.033	0.029	87.9
Benzo(ghi)perylene	768	1832	0.033	0.028	84.8

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QUALITY CONTROL REPORT

LABORATORY CONTROL STANDARD

ENSR
740 Pasquinelli Drive
Westmont, IL 60559

11/11/1998

NET Job Number: 98.13995

Mr. Wei-Lin Feng

Analyte	Prep Batch Number	Run Batch Number	True Conc.	Conc. Found	LCS % Recovery
Chrysene	768	1832	0.033	0.031	93.9
Dibenzo(a,h)anthracene	768	1832	0.033	0.029	87.9
Fluoranthene	768	1832	0.033	0.030	90.9
Fluorene	768	1832	0.033	0.030	90.9
Indeno(1,2,3-cd)pyrene	768	1832	0.033	0.028	84.8
Naphthalene	768	1832	0.033	0.028	84.8
Phenanthrene	768	1832	0.033	0.029	87.9
Pyrene	768	1832	0.033	0.033	100.0
Surr: p-Terphenyl	768	1832	2000	1,742	87.1
PNA CMPDS - 8310 NONAQUEOUS					
Acenaphthene	769	1832	0.033	0.028	84.8
Acenaphthylene	769	1832	0.033	0.032	97.0
Anthracene	769	1832	0.033	0.028	84.8
Benzo(a)anthracene	769	1832	0.033	0.030	90.9
Benzo(b)fluoranthene	769	1832	0.033	0.025	75.8
Benzo(k)fluoranthene	769	1832	0.033	0.032	97.0
Benzo(a)pyrene	769	1832	0.033	0.030	90.9
Benzo(ghi)perylene	769	1832	0.033	0.026	78.8
Chrysene	769	1832	0.033	0.031	93.9
Dibenzo(a,h)anthracene	769	1832	0.033	0.026	78.8
Fluoranthene	769	1832	0.033	0.028	84.8
Fluorene	769	1832	0.033	0.027	81.8
Indeno(1,2,3-cd)pyrene	769	1832	0.033	0.027	81.8
Naphthalene	769	1832	0.033	0.022	66.7
Phenanthrene	769	1832	0.033	0.026	78.8
Pyrene	769	1832	0.033	0.030	90.9
Surr: p-Terphenyl	769	1832	2000	1,593	79.7
PCB'S NON-AQUEOUS					
PCB-1016	381	53	500	440	88.0
PCB-1260	381	53	500	454	90.8
Decachlorobiphenyl (Surr)	381	53	100	92	92.0

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QUALITY CONTROL REPORT

LABORATORY CONTROL STANDARD

ENSR
740 Pasquinelli Drive
Westmont, IL 60559

11/11/1998

NET Job Number: 98.13995

Mr. Wei-Lin Feng

Analyte	Prep Batch Number	Run Batch Number	True Conc.	Conc. Found	LCS % Recovery
2,4,5,6-TCMX (Surr)	381	53	100	81	81.0

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QUALITY CONTROL REPORT

DUPLICATES

ENSR
740 Pasquinelli Drive
Westmont, IL 60559

Mr. Wei-Lin Feng

11/11/1998

NET Job Number: 98.13995

Analyte	Prep Batch Number	Run Batch Number	Original Analysis	Duplicate Analysis	Units	RPD
pH, Non-Aqueous		195	8.66	8.64	units	0.2
pH, Non-Aqueous		196	7.44	7.52	units	1.1
Solids, Total		2527	85.3	84.3	%	1.2
Solids, Total		2527	77.6	79.4	%	2.3

NOTE: Spikes and Duplicates may not be samples from this job.

RPD - Relative Percent Difference

Advisory Control Limits for Duplicates - RPD should be less than 20.

NET Midwest, Bartlett Division

KEY TO ABBREVIATIONS and METHOD REFERENCES

<	:	Less than; When appearing in the results column indicates the analyte was not detected at or above the reported value.
mg/L	:	Concentration in units of milligrams of analyte per liter of sample. Measurement used for aqueous samples. Can also be expressed as parts per million (ppm).
ug/g	:	Concentration in units of micrograms of analyte per gram of sample. Measurement used for non-aqueous samples. Can also be expressed as parts per million (ppm) or mg/Kg.
ug/L	:	Concentration in units of micrograms of analyte per liter of sample. Measurement used for aqueous samples. Can also be expressed as parts per billion (ppb).
ug/Kg	:	Concentration in units of micrograms of analyte per kilogram of sample. Measurement used for non-aqueous samples. Can also be expressed as parts per billion (ppb).
TCLP	:	These initials appearing in front of an analyte name indicate that the Toxicity Characteristic Leaching Procedure (TCLP) was performed for this test.
Surr:	:	These initials are the abbreviation for surrogate. Surrogates are compounds that are chemically similar to the compounds of interest. They are part of the method quality control requirements.
%	:	Percent; To convert ppm to %, divide the result by 10,000. To convert % to ppm, multiply the result by 10,000.
ICP	:	Indicates analysis was performed using Inductively Coupled Plasma Spectroscopy.
AA	:	Indicates analysis was performed using Atomic Absorption Spectroscopy.
GFAA	:	Indicates analysis was performed using Graphite Furnace Atomic Absorption Spectroscopy.
PQL	:	Practical Quantitation Limit; the lowest level that can be reliably achieved within specified limits of precision and accuracy during routine laboratory operating conditions.

Method References

(1) Methods 1000 through 9999: see "Test Methods for Evaluating Solid Waste", USEPA SW-846, 3rd Edition, 1986.

(2) ASTM "American Society for Testing Materials"

(3) Methods 100 through 499: see "Methods for Chemical Analysis of Water and Wastes", USEPA, 600/4-79-020, Rev. 1983.

(4) See "Standard Methods for the Examination of Water and Wastewater", 17th Ed, APHA, 1989.

(5) Methods 600 through 625: see "Guidelines Establishing Test Procedures for the Analysis of Pollutants", USEPA Federal Register Vol. 49 No. 209, October 1984.

(6) Methods 500 through 599: see "Methods for the Determination of Organic Compounds in Drinking Water," USEPA 600/4-88/039, Rev. 1988.

(7) See "Methods for the Determination of Metals in Environmental Samples", Supplement I EPA-600/R-94/111, May 1994.

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(8) See "Standard Methods for the Examination of Water and Wastewater", 18th Ed., APHA, 1992.

(9) Methods 1000 through 9999: see "Test Methods for Evaluating Solid Waste", USEPA SW-846, 3rd Edition, 1986, Including Updates I and II.

(10) This method is from the 2nd Edition of "Test Methods for Evaluating Solid Waste", USEPA SW-846. It has been dropped from the 3rd Edition, 1986.

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NET NATIONAL ENVIRONMENTAL TESTING, INC.

CHAIN OF CUSTODY RECORD

COMPANY ENSR Corp
ADDRESS 140 Pasquinelli Dr. St. 124 Westmont, IL
PHONE (630) 887 1700 FAX (630) 850 5307
PROJECT NAME/LOCATION ComEd Waukegan
PROJECT NUMBER 1801023610
PROJECT MANAGER Wei-Lin Feng / Karen Dolnicek

REPORT TO: K. Dolnicek
INVOICE TO: ENSR
P.O. NO.
NET QUOTE NO.

SAMPLED BY B. Buckley (PRINT NAME) B Buckley SIGNATURE
(PRINT NAME) SIGNATURE

DATE 1998	TIME	SAMPLE ID/DESCRIPTION	MATRIX	GRAB	COMP	# and Type of Containers: HCl	NaOH	HNO_3	H_2SO_4	OTHER	ANALYSES: PH 9045	PNAs 8310	BTEX 8260	PCBs 8081	TPH 8015	RCRA Metals (6 TOTAL)				COMMENTS
10/27	810	B23(1-3)	S	X						2	X	X	X	X		X				NO TPH
10/27	1345	S7	S	X						2	X	X	X	X	X	X				
10/27	1350	B3 (1-3)	S	X						2	X	X	X	X		X				NO TPH
10/27	1410	S4	S	X						2	X	X	X	X	X	X				
10/27	1425	S5	S	X						2	X	X	X	X	X	X				
10/27	1435	S3	S	X						2	X	X	X	X	X	X				
10/27	1445	S2	S	X						2	X	X	X	X	X	X				
10/27	1450	B18 (1-3)	S	X						2	X	X	X	X		X				NO TPH
10/28	740	S15	S	X						2	X	X	X	X	X	X				
10/28	745	S14	S	X						2	X	X	X	X	X	X				
10/28	750	S13	S	X						2	X	X	X	X	X	X				
10/28	835	B12 (1-3)	S	X						2	X	X	X	X		X				NO TPH
10/28	945	S9	S	X						2	X	X	X	X	X	X				
10/28	1110	S8	S	X						2	X	X	X	X	X	X				
10/28	1130	S6	S	X						2	X	X	X	X	X	X				

To assist us in selecting the proper method
Is this work being conducted for regulatory compliance monitoring? Yes ___ No ___
Is this work being conducted for regulatory enforcement action? Yes ___ No ___
Which regulations apply: RCRA ___ NPDES Wastewater ___ UST ___ Drinking Water ___ Other ___ None ___

CONDITION OF SAMPLE: BOTTLES INTACT? (YES) / NO FIELD FILTERED? YES / (NO)
COC SEALS PRESENT AND INTACT? (YES) / NO VOLATILES FREE OF HEADSPACE? (YES) / NO
TEMPERATURE UPON RECEIPT: .3 °C Wet Ice
Bottles supplied by NET? (YES) / NO

SAMPLE REMAINDER DISPOSAL: RETURN SAMPLE REMAINDER TO CLIENT VIA ___
I REQUEST NET TO DISPOSE OF ALL SAMPLE REMAINDERS ___ DATE ___

RELINQUISHED BY:	DATE	TIME	RECEIVED BY:	RELINQUISHED BY:	DATE	TIME	RECEIVED FOR NET BY:
B. Buckley	10/28/98	1530			10/29/98	10:30	JDale

METHOD OF SHIPMENT: FEDEX
REMARKS:

[redacted]ORIGIN[redacted]TE [redacted]ET PR[redacted]MANAG[redacted]LLOW[redacted]CUST[redacted]OPY [redacted]

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NET® NATIONAL ENVIRONMENTAL TESTING, INC.

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(800) 807-2877

Mr. Wei-Lin Feng
ENSR
740 Pasquinelli Drive
Westmont, IL 60559

11/11/1998

NET Job Number: 98.14072

IEPA Cert. No.: 100221
WDNR Cert. No.: 999447130
A2LA Cert. No.: 0453-01

Enclosed is the Analytical and Quality Control reports for the following samples submitted to Bartlett Division of NET, Inc. for analysis.

Project Description: ComEd-Waukegan; 1801-023 ~~210~~ 610

Sample Number	Sample Description	Date Taken	Date Received
500665	B-10 (0-4')	10/29/1998	10/30/1998
500666	B-11 (0-4')	10/29/1998	10/30/1998
500667	B-9 (0-4')	10/29/1998	10/30/1998
500668	B-8 (0-4')	10/29/1998	10/30/1998
500669	B-6 (0-4')	10/29/1998	10/30/1998
500670	B-7 (0-4')	10/29/1998	10/30/1998
500671	B-1 (0-4')	10/29/1998	10/30/1998
500672	B-15 (0-4')	10/29/1998	10/30/1998
500673	B-17 (0-4')	10/29/1998	10/30/1998
500674	S-11	10/29/1998	10/30/1998
500675	X-4	10/29/1998	10/30/1998
500676	X-1	10/29/1998	10/30/1998
500677	X-2	10/29/1998	10/30/1998
500678	S-6	10/29/1998	10/30/1998

Sample analysis in support of the project referenced above has been completed and results are presented on the following pages. These results apply only to the samples analyzed. Reproduction of this report only in whole is permitted. Please refer to the enclosed "Key to Abbreviations" for definition of terms. Procedures used follow NET Standard Operating Procedures which reference the methods listed on your report. Should you have questions regarding procedures or results, please do not hesitate to call. NET has been pleased to provide these analytical services for you.

This Quality Control report is generated on a batch basis. All information contained in this report is for the analytical batch(es) in which your sample(s) were analyzed.

Approved by:

Mary Pearson

Mary Pearson
Project Manager

NATIONAL ENVIRONMENTAL TESTING, INC.

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Mr. Wei-Lin Feng
ENSR
740 Pasquinelli Drive
Westmont, IL 60559

11/11/1998

NET Job Number: 98.14072

IEPA Cert. No.: 100221
WDNR Cert. No.: 999447130
A2LA Cert. No.: 0453-01

Enclosed is the Analytical and Quality Control reports for the following samples submitted to Bartlett Division of NET, Inc. for analysis.

Project Description: ComEd-Waukegan; 1801-023-210

Sample Number	Sample Description	Date Taken	Date Received
500679	X-3	10/29/1998	10/30/1998
500680	X-5	10/29/1998	10/30/1998
500681	X-6	10/29/1998	10/30/1998

Sample analysis in support of the project referenced above has been completed and results are presented on the following pages. These results apply only to the samples analyzed. Reproduction of this report only in whole is permitted. Please refer to the enclosed "Key to Abbreviations" for definition of terms. Procedures used follow NET Standard Operating Procedures which reference the methods listed on your report. Should you have questions regarding procedures or results, please do not hesitate to call. NET has been pleased to provide these analytical services for you.

This Quality Control report is generated on a batch basis. All information contained in this report is for the analytical batch(es) in which your sample(s) were analyzed.

Approved by:

Mary Pearson

Mary Pearson
Project Manager

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ANALYTICAL REPORT

Mr. Wei-Lin Feng
ENSR
740 Pasquinelli Drive
Westmont, IL 60559

11/11/1998

Sample No. : 500665

NET Job No.: 98.14072

Sample Description: B-10 (0-4')
ComEd-Waukegan; 1801-023-210

Date Taken: 10/29/1998
Time Taken: 09:10
IEPA Cert. No. 100221

Date Received: 10/30/1998
Time Received: 12:45
WDNR Cert. No. 999447130

Parameter	Results	Units	Date of Analysis	Method PQL	Analyst	Batch No. Prep/Run		Analytical Method
pH, Non-Aqueous	8.40	units	11/06/1998	0.10	nwg		196	SW 9045B
Solids, Total	90.9	%	11/04/1998	0.1	aks		2528	SM 2540
Arsenic, GFAA	5.9	mg/kg dw	11/09/1998	0.55	jtt	236	674	SW 7060
Barium, ICP	42	mg/kg dw	11/07/1998	1.1	jtt	1169	2188	SW 6010B
Cadmium, ICP	0.57	mg/kg dw	11/06/1998	0.55	jtt	1169	2174	SW 6010B
Chromium, ICP	7.6	mg/kg dw	11/06/1998	2.2	jtt	1169	2159	SW 6010B
Lead, ICP	34	mg/kg dw	11/06/1998	4.4	jtt	1169	2397	SW 6010B
Mercury, CVAA	0.053	mg/kg dw	11/06/1998	0.044	sep	666	770	SW 7471A
Selenium, GFAA	<0.28	mg/kg dw	11/08/1998	0.28	jtt	236	562	SW 7740
Silver, AA	<2.2	mg/kg dw	11/04/1998	2.2	sep	494	571	SW 7760
UST VOLATILES NON-AQUEOUS								
Benzene	<0.006	mg/kg dw	11/06/1998	0.006	jap		77	SW 8260A
Ethylbenzene	<0.006	mg/kg dw	11/06/1998	0.006	jap		77	SW 8260A
Toluene	<0.006	mg/kg dw	11/06/1998	0.006	jap		77	SW 8260A
Xylenes, Total	<0.006	mg/kg dw	11/06/1998	0.006	jap		77	SW 8260A
Dibromofluoromethane (Surr)	101.2	%	11/06/1998	81-129	jap		77	SW 8260A
Toluene-d8 (Surr)	104.4	%	11/06/1998	74-129	jap		77	SW 8260A
4-Bromofluoromethane (Surr)	109.0	%	11/06/1998	70-130	jap		77	SW 8260A
Prep, 8310 PNAs NON-AQUEOUS	extracted		11/03/1998		mmv	768		SW 3540C
PNA CMPDS - 8310 NONAQUEOUS								
Acenaphthene	<0.022	mg/kg dw	11/10/1998	0.022	keh	768	1833	SW 8310
Acenaphthylene	<0.022	mg/kg dw	11/10/1998	0.022	keh	768	1833	SW 8310
Anthracene	<0.044	mg/kg dw	11/10/1998	0.044	keh	768	1833	SW 8310
Benzo(a)anthracene	0.051	mg/kg dw	11/10/1998	0.0029	keh	768	1833	SW 8310
Benzo(b)fluoranthene	0.031	mg/kg dw	11/10/1998	0.0040	keh	768	1833	SW 8310

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ANALYTICAL REPORT

Mr. Wei-Lin Feng
ENSR
740 Pasquinelli Drive
Westmont, IL 60559

11/11/1998

Sample No. : 500665

NET Job No.: 98.14072

Sample Description: B-10 (0-4')
ComEd-Waukegan; 1801-023-210

Date Taken: 10/29/1998
Time Taken: 09:10
IEPA Cert. No. 100221

Date Received: 10/30/1998
Time Received: 12:45
WDNR Cert. No. 999447130

Parameter	Results	Units	Date of Analysis	Method PQL	Analyst	Batch No. Prep/Run		Analytical Method
Benzo(k)fluoranthene	0.022	mg/kg dw	11/10/1998	0.0037	keh	768	1833	SW 8310
Benzo(a)pyrene	0.033	mg/kg dw	11/10/1998	0.0051	keh	768	1833	SW 8310
Benzo(ghi)perylene	<0.044	mg/kg dw	11/10/1998	0.044	keh	768	1833	SW 8310
Chrysene	0.047	mg/kg dw	11/10/1998	0.03	keh	768	1833	SW 8310
Dibenzo(a,h)anthracene	<0.007	mg/kg dw	11/10/1998	0.007	keh	768	1833	SW 8310
Fluoranthene	0.12	mg/kg dw	11/10/1998	0.022	keh	768	1833	SW 8310
Fluorene	<0.022	mg/kg dw	11/10/1998	0.022	keh	768	1833	SW 8310
Indeno(1,2,3-cd)pyrene	0.021	mg/kg dw	11/10/1998	0.0095	keh	768	1833	SW 8310
Naphthalene	0.041	mg/kg dw	11/10/1998	0.028	keh	768	1833	SW 8310
Phenanthrene	0.086	mg/kg dw	11/10/1998	0.044	keh	768	1833	SW 8310
Pyrene	0.074	mg/kg dw	11/10/1998	0.022	keh	768	1833	SW 8310
Surr: p-Terphenyl	113.8	%	11/10/1998	43-125	keh	768	1833	SW 8310
PCB Non-Aqueous Extraction	COMPLETE		11/04/1998	COMPLETE	mmv	381		SW 3540C
PCB'S NON-AQUEOUS								
PCB-1016	<0.044	mg/kg dw	11/07/1998	0.044	tls	381	60	SW 8082
PCB-1221	<0.044	mg/kg dw	11/07/1998	0.044	tls	381	60	SW 8082
PCB-1232	<0.044	mg/kg dw	11/07/1998	0.044	tls	381	60	SW 8082
PCB-1242	<0.044	mg/kg dw	11/07/1998	0.044	tls	381	60	SW 8082
PCB-1248	<0.044	mg/kg dw	11/07/1998	0.044	tls	381	60	SW 8082
PCB-1254	<0.044	mg/kg dw	11/07/1998	0.044	tls	381	60	SW 8082
PCB-1260	<0.044	mg/kg dw	11/07/1998	0.044	tls	381	60	SW 8082
Decachlorobiphenyl (Surr)	63.0	%	11/07/1998	NA	tls	381	60	SW 8082
2,4,5,6-TCMX (Surr)	80.0	%	11/07/1998	NA	tls	381	60	SW 8082

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ANALYTICAL REPORT

Mr. Wei-Lin Feng
ENSR
740 Pasquinelli Drive
Westmont, IL 60559

11/11/1998

Sample No. : 500666

NET Job No.: 98.14072

Sample Description: B-11 (0-4')
ComEd-Waukegan; 1801-023-210

Date Taken: 10/29/1998
Time Taken: 09:20
IEPA Cert. No. 100221

Date Received: 10/30/1998
Time Received: 12:45
WDNR Cert. No. 999447130

Parameter	Results	Units	Date of Analysis	Method PQL	Analyst	Batch No. Prep/Run	Analytical Method
pH, Non-Aqueous	7.46	units	11/06/1998	0.10	nwg	196	SW 9045B
Solids, Total	88.8	%	11/04/1998	0.1	aks	2528	SM 2540
Arsenic, GFAA	18	mg/kg dw	11/09/1998	0.56	jtt	236 674	SW 7060
Barium, ICP	59	mg/kg dw	11/07/1998	1.1	jtt	1169 2188	SW 6010B
Cadmium, ICP	1.9	mg/kg dw	11/06/1998	0.56	jtt	1169 2174	SW 6010B
Chromium, ICP	25	mg/kg dw	11/06/1998	2.3	jtt	1169 2159	SW 6010B
Lead, ICP	64	mg/kg dw	11/06/1998	4.5	jtt	1169 2397	SW 6010B
Mercury, CVAA	0.074	mg/kg dw	11/06/1998	0.045	sep	666 770	SW 7471A
Selenium, GFAA	<0.28	mg/kg dw	11/08/1998	0.28	jtt	236 562	SW 7740
Silver, AA	<2.3	mg/kg dw	11/04/1998	2.3	sep	494 571	SW 7760
UST VOLATILES NON-AQUEOUS							
Benzene	<0.006	mg/kg dw	11/06/1998	0.006	jap	77	SW 8260A
Ethylbenzene	<0.006	mg/kg dw	11/06/1998	0.006	jap	77	SW 8260A
Toluene	<0.006	mg/kg dw	11/06/1998	0.006	jap	77	SW 8260A
Xylenes, Total	<0.006	mg/kg dw	11/06/1998	0.006	jap	77	SW 8260A
Dibromofluoromethane (Surr)	94.6	%	11/06/1998	81-129	jap	77	SW 8260A
Toluene-d8 (Surr)	102.6	%	11/06/1998	74-129	jap	77	SW 8260A
4-Bromofluoromethane (Surr)	101.2	%	11/06/1998	70-130	jap	77	SW 8260A
Prep, 8310 PNAs NON-AQUEOUS	extracted		11/03/1998		mmv	768	SW 3540C
PNA CMPDS - 8310 NONAQUEOUS	ELV						
Acenaphthene	<5.4	mg/kg dw	11/10/1998	0.023	keh	768 1833	SW 8310
Acenaphthylene	<1.8	mg/kg dw	11/10/1998	0.023	keh	768 1833	SW 8310
Anthracene	<3.6	mg/kg dw	11/10/1998	0.045	keh	768 1833	SW 8310
Benzo(a)anthracene	6.1	mg/kg dw	11/10/1998	0.0029	keh	768 1833	SW 8310
Benzo(b)fluoranthene	3.5	mg/kg dw	11/10/1998	0.0041	keh	768 1833	SW 8310

ELV : Elevated reporting limits due to matrix interference.

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ANALYTICAL REPORT

Mr. Wei-Lin Feng
ENSR
740 Pasquinelli Drive
Westmont, IL 60559

11/11/1998

Sample No. : 500666

NET Job No.: 98.14072

Sample Description: B-11 (0-4')
ComEd-Waukegan; 1801-023-210

Date Taken: 10/29/1998
Time Taken: 09:20
IEPA Cert. No. 100221

Date Received: 10/30/1998
Time Received: 12:45
WDNR Cert. No. 999447130

Parameter	Results	Units	Date of Analysis	Method PQL	Analyst	Batch No. Prep/Run		Analytical Method
Benzo(k)fluoranthene	<2.9	mg/kg dw	11/10/1998	0.0038	keh	768	1833	SW 8310
Benzo(a)pyrene	3.5	mg/kg dw	11/10/1998	0.0052	keh	768	1833	SW 8310
Benzo(ghi)perylene	4.8	mg/kg dw	11/10/1998	0.045	keh	768	1833	SW 8310
Chrysene	9.1	mg/kg dw	11/10/1998	0.03	keh	768	1833	SW 8310
Dibenzo(a,h)anthracene	0.95	mg/kg dw	11/10/1998	0.007	keh	768	1833	SW 8310
Fluoranthene	4.6	mg/kg dw	11/10/1998	0.023	keh	768	1833	SW 8310
Fluorene	<1.8	mg/kg dw	11/10/1998	0.023	keh	768	1833	SW 8310
Indeno(1,2,3-cd)pyrene	1.6	mg/kg dw	11/10/1998	0.0097	keh	768	1833	SW 8310
Naphthalene	<2.2	mg/kg dw	11/10/1998	0.028	keh	768	1833	SW 8310
Phenanthrene	23	mg/kg dw	11/10/1998	0.045	keh	768	1833	SW 8310
Pyrene	11	mg/kg dw	11/10/1998	0.023	keh	768	1833	SW 8310
Surr: p-Terphenyl	Diluted out		11/10/1998	43-125	keh	768	1833	SW 8310
PCB Non-Aqueous Extraction	COMPLETE		11/04/1998	COMPLETE	mmv	381		SW 3540C
PCB'S NON-AQUEOUS								
PCB-1016	<0.045	mg/kg dw	11/07/1998	0.045	tls	381	60	SW 8082
PCB-1221	<0.045	mg/kg dw	11/07/1998	0.045	tls	381	60	SW 8082
PCB-1232	<0.045	mg/kg dw	11/07/1998	0.045	tls	381	60	SW 8082
PCB-1242	<0.045	mg/kg dw	11/07/1998	0.045	tls	381	60	SW 8082
PCB-1248	<0.045	mg/kg dw	11/07/1998	0.045	tls	381	60	SW 8082
PCB-1254	<0.045	mg/kg dw	11/07/1998	0.045	tls	381	60	SW 8082
PCB-1260	<0.045	mg/kg dw	11/07/1998	0.045	tls	381	60	SW 8082
Decachlorobiphenyl (Surr)	89.0	%	11/07/1998	NA	tls	381	60	SW 8082
2,4,5,6-TCMX (Surr)	80.0	%	11/07/1998	NA	tls	381	60	SW 8082

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ANALYTICAL REPORT

Mr. Wei-Lin Feng
ENSR
740 Pasquinelli Drive
Westmont, IL 60559

11/11/1998

Sample No. : 500667

NET Job No.: 98.14072

Sample Description: B-9 (0-4')
ComEd-Waukegan; 1801-023-210

Date Taken: 10/29/1998
Time Taken: 09:30
IEPA Cert. No. 100221

Date Received: 10/30/1998
Time Received: 12:45
WDNR Cert. No. 999447130

Parameter	Results	Units	Date of Analysis	Method PQL	Analyst	Batch No. Prep/Run	Analytical Method
pH, Non-Aqueous	9.12	units	11/06/1998	0.10	nwg	196	SW 9045B
Solids, Total	86.3	%	11/04/1998	0.1	aks	2528	SM 2540
Arsenic, GFAA	16	mg/kg dw	11/09/1998	0.58	jtt	236 674	SW 7060
Barium, ICP	290	mg/kg dw	11/07/1998	1.2	jtt	1169 2188	SW 6010B
Cadmium, ICP	1.3	mg/kg dw	11/06/1998	0.58	jtt	1169 2174	SW 6010B
Chromium, ICP	22	mg/kg dw	11/06/1998	2.3	jtt	1169 2159	SW 6010B
Lead, ICP	81	mg/kg dw	11/06/1998	4.6	jtt	1169 2397	SW 6010B
Mercury, CVAA	0.27	mg/kg dw	11/06/1998	0.046	sep	666 770	SW 7471A
Selenium, GFAA	0.31	mg/kg dw	11/08/1998	0.29	jtt	236 562	SW 7740
Silver, AA	<2.3	mg/kg dw	11/04/1998	2.3	sep	494 571	SW 7760
UST VOLATILES NON-AQUEOUS							
Benzene	<0.006	mg/kg dw	11/06/1998	0.006	jap	77	SW 8260A
Ethylbenzene	<0.006	mg/kg dw	11/06/1998	0.006	jap	77	SW 8260A
Toluene	<0.006	mg/kg dw	11/06/1998	0.006	jap	77	SW 8260A
Xylenes, Total	<0.006	mg/kg dw	11/06/1998	0.006	jap	77	SW 8260A
Dibromofluoromethane (Surr)	94.2	%	11/06/1998	81-129	jap	77	SW 8260A
Toluene-d8 (Surr)	102.0	%	11/06/1998	74-129	jap	77	SW 8260A
4-Bromofluoromethane (Surr)	102.6	%	11/06/1998	70-130	jap	77	SW 8260A
Prep, 8310 PNAs NON-AQUEOUS	extracted		11/03/1998		mmv	768	SW 3540C
PNA CMPDS - 8310 NONAQUEOUS	ELV						
Acenaphthene	<1.4	mg/kg dw	11/10/1998	0.023	keh	768 1833	SW 8310
Acenaphthylene	<1.4	mg/kg dw	11/10/1998	0.023	keh	768 1833	SW 8310
Anthracene	<2.8	mg/kg dw	11/10/1998	0.046	keh	768 1833	SW 8310
Benzo(a)anthracene	4.6	mg/kg dw	11/10/1998	0.0030	keh	768 1833	SW 8310
Benzo(b)fluoranthene	3.7	mg/kg dw	11/10/1998	0.0042	keh	768 1833	SW 8310

ELV : Elevated reporting limits due to matrix interference.

MWG13-15_45991

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ANALYTICAL REPORT

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ENSR
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11/11/1998

Sample No. : 500667

NET Job No.: 98.14072

Sample Description: B-9 (0-4')
ComEd-Waukegan; 1801-023-210

Date Taken: 10/29/1998
Time Taken: 09:30
IEPA Cert. No. 100221

Date Received: 10/30/1998
Time Received: 12:45
WDNR Cert. No. 999447130

Parameter	Results	Units	Date of Analysis	Method PQL	Analyst	Batch No. Prep/Run		Analytical Method
Benzo(k)fluoranthene	2.2	mg/kg dw	11/10/1998	0.0039	keh	768	1833	SW 8310
Benzo(a)pyrene	4.4	mg/kg dw	11/10/1998	0.0053	keh	768	1833	SW 8310
Benzo(ghi)perylene	3.0	mg/kg dw	11/10/1998	0.046	keh	768	1833	SW 8310
Chrysene	3.7	mg/kg dw	11/10/1998	0.03	keh	768	1833	SW 8310
Dibenzo(a,h)anthracene	<0.4	mg/kg dw	11/10/1998	0.007	keh	768	1833	SW 8310
Fluoranthene	9.0	mg/kg dw	11/10/1998	0.023	keh	768	1833	SW 8310
Fluorene	<1.4	mg/kg dw	11/10/1998	0.023	keh	768	1833	SW 8310
Indeno(1,2,3-cd)pyrene	2.5	mg/kg dw	11/10/1998	0.010	keh	768	1833	SW 8310
Naphthalene	<1.7	mg/kg dw	11/10/1998	0.029	keh	768	1833	SW 8310
Phenanthrene	5.2	mg/kg dw	11/10/1998	0.046	keh	768	1833	SW 8310
Pyrene	7.3	mg/kg dw	11/10/1998	0.023	keh	768	1833	SW 8310
Surr: p-Terphenyl	Diluted out		11/10/1998	43-125	keh	768	1833	SW 8310
PCB Non-Aqueous Extraction	COMPLETE		11/04/1998	COMPLETE	mmv	381		SW 3540C
PCB'S NON-AQUEOUS								
PCB-1016	<0.046	mg/kg dw	11/07/1998	0.046	tls	381	60	SW 8082
PCB-1221	<0.046	mg/kg dw	11/07/1998	0.046	tls	381	60	SW 8082
PCB-1232	<0.046	mg/kg dw	11/07/1998	0.046	tls	381	60	SW 8082
PCB-1242	<0.046	mg/kg dw	11/07/1998	0.046	tls	381	60	SW 8082
PCB-1248	<0.046	mg/kg dw	11/07/1998	0.046	tls	381	60	SW 8082
PCB-1254	<0.046	mg/kg dw	11/07/1998	0.046	tls	381	60	SW 8082
PCB-1260	0.057	mg/kg dw	11/07/1998	0.046	tls	381	60	SW 8082
Decachlorobiphenyl (Surr)	59.0	%	11/07/1998	NA	tls	381	60	SW 8082
2,4,5,6-TCMX (Surr)	72.0	%	11/07/1998	NA	tls	381	60	SW 8082

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ANALYTICAL REPORT

Mr. Wei-Lin Feng
ENSR
740 Pasquinelli Drive
Westmont, IL 60559

11/11/1998

Sample No. : 500668

NET Job No.: 98.14072

Sample Description: B-8 (0-4')
ComEd-Waukegan; 1801-023-210

Date Taken: 10/29/1998
Time Taken: 09:35
IEPA Cert. No. 100221

Date Received: 10/30/1998
Time Received: 12:45
WDNR Cert. No. 999447130

Parameter	Results	Units	Date of Analysis	Method PQL	Analyst	Batch No. Prep/Run		Analytical Method
pH, Non-Aqueous	8.68	units	11/06/1998	0.10	nwg		196	SW 9045B
Solids, Total	92.2	%	11/04/1998	0.1	aks		2528	SM 2540
Arsenic, GFAA	6.3	mg/kg dw	11/09/1998	0.54	jtt	236	674	SW 7060
Barium, ICP	27	mg/kg dw	11/07/1998	1.1	jtt	1169	2188	SW 6010B
Cadmium, ICP	<0.54	mg/kg dw	11/06/1998	0.54	jtt	1169	2174	SW 6010B
Chromium, ICP	8.5	mg/kg dw	11/06/1998	2.2	jtt	1169	2159	SW 6010B
Lead, ICP	35	mg/kg dw	11/06/1998	4.3	jtt	1169	2397	SW 6010B
Mercury, CVAA	0.52	mg/kg dw	11/06/1998	0.043	sep	666	770	SW 7471A
Selenium, GFAA	<0.27	mg/kg dw	11/08/1998	0.27	jtt	236	562	SW 7740
Silver, AA	<2.2	mg/kg dw	11/04/1998	2.2	sep	494	571	SW 7760
UST VOLATILES NON-AQUEOUS								
Benzene	<0.005	mg/kg dw	11/06/1998	0.005	jap		77	SW 8260A
Ethylbenzene	<0.005	mg/kg dw	11/06/1998	0.005	jap		77	SW 8260A
Toluene	<0.005	mg/kg dw	11/06/1998	0.005	jap		77	SW 8260A
Xylenes, Total	<0.005	mg/kg dw	11/06/1998	0.005	jap		77	SW 8260A
Dibromofluoromethane (Surr)	95.8	%	11/06/1998	81-129	jap		77	SW 8260A
Toluene-d8 (Surr)	96.8	%	11/06/1998	74-129	jap		77	SW 8260A
4-Bromofluoromethane (Surr)	101.4	%	11/06/1998	70-130	jap		77	SW 8260A
Prep, 8310 PNAs NON-AQUEOUS	extracted		11/03/1998		mmv	768		SW 3540C
PNA CMPDS - 8310 NONAQUEOUS	ELV							
Acenaphthene	<0.54	mg/kg dw	11/10/1998	0.022	keh	768	1833	SW 8310
Acenaphthylene	<0.1	mg/kg dw	11/10/1998	0.022	keh	768	1833	SW 8310
Anthracene	<0.2	mg/kg dw	11/10/1998	0.043	keh	768	1833	SW 8310
Benzo(a)anthracene	0.21	mg/kg dw	11/10/1998	0.0028	keh	768	1833	SW 8310
Benzo(b)fluoranthene	0.65	mg/kg dw	11/10/1998	0.0039	keh	768	1833	SW 8310

ELV : Elevated reporting limits due to matrix interference.

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ANALYTICAL REPORT

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ENSR
740 Pasquinelli Drive
Westmont, IL 60559

11/11/1998

Sample No. : 500668

NET Job No.: 98.14072

Sample Description: B-8 (0-4')
ComEd-Waukegan; 1801-023-210

Date Taken: 10/29/1998
Time Taken: 09:35
IEPA Cert. No. 100221

Date Received: 10/30/1998
Time Received: 12:45
WDNR Cert. No. 999447130

Parameter	Results	Units	Date of Analysis	Method PQL	Analyst	Batch No. Prep/Run		Analytical Method
Benzo(k)fluoranthene	0.18	mg/kg dw	11/10/1998	0.0037	keh	768	1833	SW 8310
Benzo(a)pyrene	0.31	mg/kg dw	11/10/1998	0.0050	keh	768	1833	SW 8310
Benzo(ghi)perylene	0.49	mg/kg dw	11/10/1998	0.043	keh	768	1833	SW 8310
Chrysene	0.22	mg/kg dw	11/10/1998	0.03	keh	768	1833	SW 8310
Dibenzo(a,h)anthracene	0.038	mg/kg dw	11/10/1998	0.007	keh	768	1833	SW 8310
Fluoranthene	0.98	mg/kg dw	11/10/1998	0.022	keh	768	1833	SW 8310
Fluorene	0.21	mg/kg dw	11/10/1998	0.022	keh	768	1833	SW 8310
Indeno(1,2,3-cd)pyrene	0.29	mg/kg dw	11/10/1998	0.0093	keh	768	1833	SW 8310
Naphthalene	0.16	mg/kg dw	11/10/1998	0.027	keh	768	1833	SW 8310
Phenanthrene	0.36	mg/kg dw	11/10/1998	0.043	keh	768	1833	SW 8310
Pyrene	0.76	mg/kg dw	11/10/1998	0.022	keh	768	1833	SW 8310
Surr: p-Terphenyl	Masked		11/10/1998	43-125	keh	768	1833	SW 8310
PCB Non-Aqueous Extraction	COMPLETE		11/04/1998	COMPLETE	mmv	382		SW 3540C
PCB'S NON-AQUEOUS								
PCB-1016	<0.043	mg/kg dw	11/07/1998	0.043	tls	382	58	SW 8082
PCB-1221	<0.043	mg/kg dw	11/07/1998	0.043	tls	382	58	SW 8082
PCB-1232	<0.043	mg/kg dw	11/07/1998	0.043	tls	382	58	SW 8082
PCB-1242	<0.043	mg/kg dw	11/07/1998	0.043	tls	382	58	SW 8082
PCB-1248	<0.043	mg/kg dw	11/07/1998	0.043	tls	382	58	SW 8082
PCB-1254	<0.043	mg/kg dw	11/07/1998	0.043	tls	382	58	SW 8082
PCB-1260	<0.043	mg/kg dw	11/07/1998	0.043	tls	382	58	SW 8082
Decachlorobiphenyl (Surr)	79.0	%	11/07/1998	NA	tls	382	58	SW 8082
2,4,5,6-TCMX (Surr)	88.0	%	11/07/1998	NA	tls	382	58	SW 8082

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ANALYTICAL REPORT

Mr. Wei-Lin Feng
ENSR
740 Pasquinelli Drive
Westmont, IL 60559

11/11/1998

Sample No. : 500669

NET Job No.: 98.14072

Sample Description: B-6 (0-4')
ComEd-Waukegan; 1801-023-210

Date Taken: 10/29/1998
Time Taken: 09:55
IEPA Cert. No. 100221

Date Received: 10/30/1998
Time Received: 12:45
WDNR Cert. No. 999447130

Parameter	Results	Units	Date of Analysis	Method PQL	Analyst	Batch No. Prep/Run	Analytical Method
pH, Non-Aqueous	9.33	units	11/06/1998	0.10	nwg	196	SW 9045B
Solids, Total	94.4	%	11/04/1998	0.1	aks	2528	SM 2540
Arsenic, GFAA	3.3	mg/kg dw	11/09/1998	0.53	jtt	236 674	SW 7060
Barium, ICP	14	mg/kg dw	11/07/1998	1.1	jtt	1169 2188	SW 6010B
Cadmium, ICP	<0.53	mg/kg dw	11/06/1998	0.53	jtt	1169 2174	SW 6010B
Chromium, ICP	5.7	mg/kg dw	11/06/1998	2.1	jtt	1169 2159	SW 6010B
Lead, ICP	10	mg/kg dw	11/06/1998	4.2	jtt	1169 2397	SW 6010B
Mercury, CVAA	<0.042	mg/kg dw	11/06/1998	0.042	sep	666 770	SW 7471A
Selenium, GFAA	<0.26	mg/kg dw	11/08/1998	0.26	jtt	236 562	SW 7740
Silver, AA	<2.1	mg/kg dw	11/04/1998	2.1	sep	494 571	SW 7760
UST VOLATILES NON-AQUEOUS							
Benzene	<0.005	mg/kg dw	11/06/1998	0.005	jap	78	SW 8260A
Ethylbenzene	<0.005	mg/kg dw	11/06/1998	0.005	jap	78	SW 8260A
Toluene	<0.005	mg/kg dw	11/06/1998	0.005	jap	78	SW 8260A
Xylenes, Total	0.015	mg/kg dw	11/06/1998	0.005	jap	78	SW 8260A
Dibromofluoromethane (Surr)	89.2	%	11/06/1998	81-129	jap	78	SW 8260A
Toluene-d8 (Surr)	94.2	%	11/06/1998	74-129	jap	78	SW 8260A
4-Bromofluoromethane (Surr)	95.8	%	11/06/1998	70-130	jap	78	SW 8260A
Prep, 8310 PNAs NON-AQUEOUS	extracted		11/03/1998		mmv	768	SW 3540C
PNA CMPDS - 8310 NONAQUEOUS	ELV						
Acenaphthene	<0.06	mg/kg dw	11/10/1998	0.021	keh	768 1833	SW 8310
Acenaphthylene	<0.06	mg/kg dw	11/10/1998	0.021	keh	768 1833	SW 8310
Anthracene	<0.1	mg/kg dw	11/10/1998	0.042	keh	768 1833	SW 8310
Benzo(a)anthracene	<0.030	mg/kg dw	11/10/1998	0.0028	keh	768 1833	SW 8310
Benzo(b)fluoranthene	<0.01	mg/kg dw	11/10/1998	0.0038	keh	768 1833	SW 8310

ELV : Elevated reporting limits due to matrix interference.

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ANALYTICAL REPORT

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11/11/1998

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NET Job No.: 98.14072

Sample Description: B-6 (0-4')
ComEd-Waukegan; 1801-023-210

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Time Taken: 09:55
IEPA Cert. No. 100221

Date Received: 10/30/1998
Time Received: 12:45
WDNR Cert. No. 999447130

Parameter	Results		Units	Date of Analysis	Method PQL	Analyst	Batch No. Prep/Run		Analytical Method
Benzo(k)fluoranthene	<0.01		mg/kg dw	11/10/1998	0.0036	keh	768	1833	SW 8310
Benzo(a)pyrene	<0.01		mg/kg dw	11/10/1998	0.0049	keh	768	1833	SW 8310
Benzo(ghi)perylene	<0.1		mg/kg dw	11/10/1998	0.042	keh	768	1833	SW 8310
Chrysene	<0.1		mg/kg dw	11/10/1998	0.03	keh	768	1833	SW 8310
Dibenzo(a,h)anthracene	<0.02		mg/kg dw	11/10/1998	0.006	keh	768	1833	SW 8310
Fluoranthene	<3.4		mg/kg dw	11/10/1998	0.021	keh	768	1833	SW 8310
Fluorene	<0.06		mg/kg dw	11/10/1998	0.021	keh	768	1833	SW 8310
Indeno(1,2,3-cd)pyrene	<0.03		mg/kg dw	11/10/1998	0.0091	keh	768	1833	SW 8310
Naphthalene	<0.08		mg/kg dw	11/10/1998	0.026	keh	768	1833	SW 8310
Phenanthrene	<0.1		mg/kg dw	11/10/1998	0.042	keh	768	1833	SW 8310
Pyrene	<0.06		mg/kg dw	11/10/1998	0.021	keh	768	1833	SW 8310
Surr: p-Terphenyl	128.6	SR	%	11/10/1998	43-125	keh	768	1833	SW 8310
PCB Non-Aqueous Extraction	COMPLETE			11/04/1998	COMPLETE	mmv	382		SW 3540C
PCB'S NON-AQUEOUS									
PCB-1016	<0.042		mg/kg dw	11/07/1998	0.042	tls	382	58	SW 8082
PCB-1221	<0.042		mg/kg dw	11/07/1998	0.042	tls	382	58	SW 8082
PCB-1232	<0.042		mg/kg dw	11/07/1998	0.042	tls	382	58	SW 8082
PCB-1242	<0.042		mg/kg dw	11/07/1998	0.042	tls	382	58	SW 8082
PCB-1248	<0.042		mg/kg dw	11/07/1998	0.042	tls	382	58	SW 8082
PCB-1254	<0.042		mg/kg dw	11/07/1998	0.042	tls	382	58	SW 8082
PCB-1260	0.048		mg/kg dw	11/07/1998	0.042	tls	382	58	SW 8082
Decachlorobiphenyl (Surr)	63.0		%	11/07/1998	NA	tls	382	58	SW 8082
2,4,5,6-TCMX (Surr)	70.0		%	11/07/1998	NA	tls	382	58	SW 8082

SR : Elevated surrogate recovery due to sample matrix

MWG13-15_45996

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ANALYTICAL REPORT

Mr. Wei-Lin Feng
ENSR
740 Pasquinelli Drive
Westmont, IL 60559

11/11/1998

Sample No. : 500670

NET Job No.: 98.14072

Sample Description: B-7 (0-4')
ComEd-Waukegan; 1801-023-210

Date Taken: 10/29/1998
Time Taken: 10:00
IEPA Cert. No. 100221

Date Received: 10/30/1998
Time Received: 12:45
WDNR Cert. No. 999447130

Parameter	Results	Units	Date of Analysis	Method PQL	Analyst	Batch No. Prep/Run	Analytical Method
pH, Non-Aqueous	9.06	units	11/06/1998	0.10	nwg	196	SW 9045B
Solids, Total	88.9	%	11/04/1998	0.1	aks	2528	SM 2540
Arsenic, GFAA	6.4	mg/kg dw	11/09/1998	0.56	jtt	236 674	SW 7060
Barium, ICP	247	mg/kg dw	11/07/1998	1.1	jtt	1169 2188	SW 6010B
Cadmium, ICP	<0.56	mg/kg dw	11/06/1998	0.56	jtt	1169 2174	SW 6010B
Chromium, ICP	7.6	mg/kg dw	11/06/1998	2.2	jtt	1169 2159	SW 6010B
Lead, ICP	16	mg/kg dw	11/06/1998	4.5	jtt	1169 2397	SW 6010B
Mercury, CVAA	<0.045	mg/kg dw	11/06/1998	0.045	sep	666 770	SW 7471A
Selenium, GFAA	<0.28	mg/kg dw	11/08/1998	0.28	jtt	236 562	SW 7740
Silver, AA	<2.2	mg/kg dw	11/04/1998	2.2	sep	494 571	SW 7760
UST VOLATILES NON-AQUEOUS							
Benzene	<0.006	mg/kg dw	11/06/1998	0.006	jap	78	SW 8260A
Ethylbenzene	<0.006	mg/kg dw	11/06/1998	0.006	jap	78	SW 8260A
Toluene	<0.006	mg/kg dw	11/06/1998	0.006	jap	78	SW 8260A
Xylenes, Total	<0.006	mg/kg dw	11/06/1998	0.006	jap	78	SW 8260A
Dibromofluoromethane (Surr)	92.4	%	11/06/1998	81-129	jap	78	SW 8260A
Toluene-d8 (Surr)	95.4	%	11/06/1998	74-129	jap	78	SW 8260A
4-Bromofluoromethane (Surr)	103.0	%	11/06/1998	70-130	jap	78	SW 8260A
Prep, 8310 PNAs NON-AQUEOUS	extracted		11/03/1998		mmv	768	SW 3540C
PNA CMPDS - 8310 NONAQUEOUS	ELV						
Acenaphthene	<0.09	mg/kg dw	11/09/1998	0.022	keh	768 1834	SW 8310
Acenaphthylene	<0.09	mg/kg dw	11/09/1998	0.022	keh	768 1834	SW 8310
Anthracene	<0.2	mg/kg dw	11/09/1998	0.045	keh	768 1834	SW 8310
Benzo(a)anthracene	<0.01	mg/kg dw	11/09/1998	0.0029	keh	768 1834	SW 8310
Benzo(b)fluoranthene	<0.02	mg/kg dw	11/09/1998	0.0040	keh	768 1834	SW 8310

ELV : Elevated reporting limits due to matrix interference.

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(800) 807-2877

ANALYTICAL REPORT

Mr. Wei-Lin Feng
ENSR
740 Pasquinelli Drive
Westmont, IL 60559

11/11/1998

Sample No. : 500670

NET Job No.: 98.14072

Sample Description: B-7 (0-4')
ComEd-Waukegan; 1801-023-210

Date Taken: 10/29/1998
Time Taken: 10:00
IEPA Cert. No. 100221

Date Received: 10/30/1998
Time Received: 12:45
WDNR Cert. No. 999447130

Parameter	Results	Units	Date of Analysis	Method PQL	Analyst	Batch No. Prep/Run		Analytical Method
Benzo(k)fluoranthene	<0.02	mg/kg dw	11/09/1998	0.0038	keh	768	1834	SW 8310
Benzo(a)pyrene	<0.02	mg/kg dw	11/09/1998	0.0052	keh	768	1834	SW 8310
Benzo(ghi)perylene	<0.2	mg/kg dw	11/09/1998	0.045	keh	768	1834	SW 8310
Chrysene	<0.1	mg/kg dw	11/09/1998	0.03	keh	768	1834	SW 8310
Dibenzo(a,h)anthracene	<0.03	mg/kg dw	11/09/1998	0.007	keh	768	1834	SW 8310
Fluoranthene	<0.09	mg/kg dw	11/09/1998	0.022	keh	768	1834	SW 8310
Fluorene	<0.09	mg/kg dw	11/09/1998	0.022	keh	768	1834	SW 8310
Indeno(1,2,3-cd)pyrene	<0.04	mg/kg dw	11/09/1998	0.0097	keh	768	1834	SW 8310
Naphthalene	<0.1	mg/kg dw	11/09/1998	0.028	keh	768	1834	SW 8310
Phenanthrene	<0.2	mg/kg dw	11/09/1998	0.045	keh	768	1834	SW 8310
Pyrene	<0.09	mg/kg dw	11/09/1998	0.022	keh	768	1834	SW 8310
Surr: p-Terphenyl	114.6	%	11/09/1998	43-125	keh	768	1834	SW 8310
PCB Non-Aqueous Extraction	COMPLETE		11/04/1998	COMPLETE	mmv	382		SW 3540C
PCB'S NON-AQUEOUS								
PCB-1016	<0.045	mg/kg dw	11/07/1998	0.045	tls	382	58	SW 8082
PCB-1221	<0.045	mg/kg dw	11/07/1998	0.045	tls	382	58	SW 8082
PCB-1232	<0.045	mg/kg dw	11/07/1998	0.045	tls	382	58	SW 8082
PCB-1242	<0.045	mg/kg dw	11/07/1998	0.045	tls	382	58	SW 8082
PCB-1248	<0.045	mg/kg dw	11/07/1998	0.045	tls	382	58	SW 8082
PCB-1254	<0.045	mg/kg dw	11/07/1998	0.045	tls	382	58	SW 8082
PCB-1260	<0.045	mg/kg dw	11/07/1998	0.045	tls	382	58	SW 8082
Decachlorobiphenyl (Surr)	69.0	%	11/07/1998	NA	tls	382	58	SW 8082
2,4,5,6-TCMX (Surr)	74.0	%	11/07/1998	NA	tls	382	58	SW 8082

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ANALYTICAL REPORT

Mr. Wei-Lin Feng
ENSR
740 Pasquinelli Drive
Westmont, IL 60559

11/11/1998

Sample No. : 500671

NET Job No.: 98.14072

Sample Description: B-1 (0-4')
ComEd-Waukegan; 1801-023-210

Date Taken: 10/29/1998
Time Taken: 11:10
IEPA Cert. No. 100221

Date Received: 10/30/1998
Time Received: 12:45
WDNR Cert. No. 999447130

Parameter	Results	Units	Date of Analysis	Method PQL	Analyst	Batch No. Prep/Run	Analytical Method
pH, Non-Aqueous	9.16	units	11/06/1998	0.10	nwg	197	SW 9045B
Solids, Total	94.9	%	11/04/1998	0.1	aks	2528	SM 2540
Arsenic, GFAA	6.7	mg/kg dw	11/09/1998	0.53	jtt	236 674	SW 7060
Barium, ICP	601	mg/kg dw	11/07/1998	1.1	jtt	1169 2188	SW 6010B
Cadmium, ICP	1.0	mg/kg dw	11/06/1998	0.53	jtt	1169 2174	SW 6010B
Chromium, ICP	232	mg/kg dw	11/06/1998	2.1	jtt	1169 2159	SW 6010B
Lead, ICP	40	mg/kg dw	11/06/1998	4.2	jtt	1169 2397	SW 6010B
Mercury, CVAA	<0.042	mg/kg dw	11/06/1998	0.042	sep	666 770	SW 7471A
Selenium, GFAA	<0.26	mg/kg dw	11/08/1998	0.26	jtt	236 562	SW 7740
Silver, AA	<2.1	mg/kg dw	11/04/1998	2.1	sep	494 571	SW 7760
UST VOLATILES NON-AQUEOUS							
Benzene	<0.005	mg/kg dw	11/06/1998	0.005	jap	78	SW 8260A
Ethylbenzene	<0.005	mg/kg dw	11/06/1998	0.005	jap	78	SW 8260A
Toluene	<0.005	mg/kg dw	11/06/1998	0.005	jap	78	SW 8260A
Xylenes, Total	<0.005	mg/kg dw	11/06/1998	0.005	jap	78	SW 8260A
Dibromofluoromethane (Surr)	91.8	%	11/06/1998	81-129	jap	78	SW 8260A
Toluene-d8 (Surr)	94.4	%	11/06/1998	74-129	jap	78	SW 8260A
4-Bromofluoromethane (Surr)	102.0	%	11/06/1998	70-130	jap	78	SW 8260A
Prep, 8310 PNAs NON-AQUEOUS	extracted		11/03/1998		mmv	768	SW 3540C
PNA CMPDS - 8310 NONAQUEOUS							
Acenaphthene	<0.021	mg/kg dw	11/09/1998	0.021	keh	768 1834	SW 8310
Acenaphthylene	<0.021	mg/kg dw	11/09/1998	0.021	keh	768 1834	SW 8310
Anthracene	<0.042	mg/kg dw	11/09/1998	0.042	keh	768 1834	SW 8310
Benzo(a)anthracene	0.042	mg/kg dw	11/09/1998	0.0027	keh	768 1834	SW 8310
Benzo(b)fluoranthene	0.017	mg/kg dw	11/09/1998	0.0038	keh	768 1834	SW 8310

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ANALYTICAL REPORT

Mr. Wei-Lin Feng
ENSR
740 Pasquinelli Drive
Westmont, IL 60559

11/11/1998

Sample No. : 500671

NET Job No.: 98.14072

Sample Description: B-1 (0-4')
ComEd-Waukegan; 1801-023-210

Date Taken: 10/29/1998
Time Taken: 11:10
IEPA Cert. No. 100221

Date Received: 10/30/1998
Time Received: 12:45
WDNR Cert. No. 999447130

Parameter	Results	Units	Date of Analysis	Method PQL	Analyst	Batch No. Prep/Run		Analytical Method
Benzo(k)fluoranthene	<0.027	mg/kg dw	11/09/1998	0.0036	keh	768	1834	SW 8310
Benzo(a)pyrene	0.032	mg/kg dw	11/09/1998	0.0048	keh	768	1834	SW 8310
Benzo(ghi)perylene	<0.042	mg/kg dw	11/09/1998	0.042	keh	768	1834	SW 8310
Chrysene	0.036	mg/kg dw	11/09/1998	0.03	keh	768	1834	SW 8310
Dibenzo(a,h)anthracene	0.0074	mg/kg dw	11/09/1998	0.006	keh	768	1834	SW 8310
Fluoranthene	0.030	mg/kg dw	11/09/1998	0.021	keh	768	1834	SW 8310
Fluorene	<0.021	mg/kg dw	11/09/1998	0.021	keh	768	1834	SW 8310
Indeno(1,2,3-cd)pyrene	<0.0091	mg/kg dw	11/09/1998	0.0091	keh	768	1834	SW 8310
Naphthalene	0.033	mg/kg dw	11/09/1998	0.026	keh	768	1834	SW 8310
Phenanthrene	0.061	mg/kg dw	11/09/1998	0.042	keh	768	1834	SW 8310
Pyrene	0.076	mg/kg dw	11/09/1998	0.021	keh	768	1834	SW 8310
Surr: p-Terphenyl	107.6	%	11/09/1998	43-125	keh	768	1834	SW 8310
PCB Non-Aqueous Extraction	COMPLETE		11/04/1998	COMPLETE	mmv	382		SW 3540C
PCB'S NON-AQUEOUS								
PCB-1016	<0.042	mg/kg dw	11/07/1998	0.042	tls	382	58	SW 8082
PCB-1221	<0.042	mg/kg dw	11/07/1998	0.042	tls	382	58	SW 8082
PCB-1232	<0.042	mg/kg dw	11/07/1998	0.042	tls	382	58	SW 8082
PCB-1242	<0.042	mg/kg dw	11/07/1998	0.042	tls	382	58	SW 8082
PCB-1248	<0.042	mg/kg dw	11/07/1998	0.042	tls	382	58	SW 8082
PCB-1254	<0.042	mg/kg dw	11/07/1998	0.042	tls	382	58	SW 8082
PCB-1260	<0.042	mg/kg dw	11/07/1998	0.042	tls	382	58	SW 8082
Decachlorobiphenyl (Surr)	81.0	%	11/07/1998	NA	tls	382	58	SW 8082
2,4,5,6-TCMX (Surr)	85.0	%	11/07/1998	NA	tls	382	58	SW 8082

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ANALYTICAL REPORT

Mr. Wei-Lin Feng
ENSR
740 Pasquinelli Drive
Westmont, IL 60559

11/11/1998

Sample No. : 500672

NET Job No.: 98.14072

Sample Description: B-15 (0-4')
ComEd-Waukegan; 1801-023-210

Date Taken: 10/29/1998
Time Taken: 11:30
IEPA Cert. No. 100221

Date Received: 10/30/1998
Time Received: 12:45
WDNR Cert. No. 999447130

Parameter	Results		Units	Date of Analysis	Method PQL	Analyst	Batch No. Prep/Run		Analytical Method
pH, Non-Aqueous	8.42		units	11/06/1998	0.10	nwg		197	SW 9045B
Solids, Total	87.3		%	11/04/1998	0.1	aks		2528	SM 2540
Arsenic, GFAA	13		mg/kg dw	11/09/1998	0.57	jtt	236	674	SW 7060
Barium, ICP	493		mg/kg dw	11/07/1998	1.1	jtt	1169	2188	SW 6010B
Cadmium, ICP	0.86		mg/kg dw	11/06/1998	0.57	jtt	1169	2174	SW 6010B
Chromium, ICP	126		mg/kg dw	11/06/1998	2.3	jtt	1169	2159	SW 6010B
Lead, ICP	41		mg/kg dw	11/06/1998	4.6	jtt	1169	2397	SW 6010B
Mercury, CVAA	0.055		mg/kg dw	11/06/1998	0.046	sep	666	770	SW 7471A
Selenium, GFAA	<0.29		mg/kg dw	11/08/1998	0.29	jtt	236	562	SW 7740
Silver, AA	<2.3		mg/kg dw	11/04/1998	2.3	sep	494	571	SW 7760
UST VOLATILES NON-AQUEOUS									
Benzene	<0.006		mg/kg dw	11/06/1998	0.006	jap		78	SW 8260A
Ethylbenzene	<0.006		mg/kg dw	11/06/1998	0.006	jap		78	SW 8260A
Toluene	<0.006		mg/kg dw	11/06/1998	0.006	jap		78	SW 8260A
Xylenes, Total	<0.006		mg/kg dw	11/06/1998	0.006	jap		78	SW 8260A
Dibromofluoromethane (Surr)	91.6		%	11/06/1998	81-129	jap		78	SW 8260A
Toluene-d8 (Surr)	91.4		%	11/06/1998	74-129	jap		78	SW 8260A
4-Bromofluoromethane (Surr)	99.4		%	11/06/1998	70-130	jap		78	SW 8260A
Prep, 8310 PNAs NON-AQUEOUS	extracted			11/05/1998		mmv	769		SW 3540C
PNA CMPDS - 8310 NONAQUEOUS									
Acenaphthene	<0.023		mg/kg dw	11/09/1998	0.023	keh	769	1834	SW 8310
Acenaphthylene	<0.023		mg/kg dw	11/09/1998	0.023	keh	769	1834	SW 8310
Anthracene	<0.071	MX	mg/kg dw	11/09/1998	0.046	keh	769	1834	SW 8310
Benzo(a)anthracene	<0.063	MX	mg/kg dw	11/09/1998	0.0030	keh	769	1834	SW 8310
Benzo(b)fluoranthene	0.014		mg/kg dw	11/09/1998	0.0041	keh	769	1834	SW 8310

MX : Dilution required due to sample matrix; analyte is not detected.

NATIONAL ENVIRONMENTAL TESTING, INC.

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ANALYTICAL REPORT

Mr. Wei-Lin Feng
ENSR
740 Pasquinelli Drive
Westmont, IL 60559

11/11/1998

Sample No. : 500672

NET Job No.: 98.14072

Sample Description: B-15 (0-4')
ComEd-Waukegan; 1801-023-210

Date Taken: 10/29/1998
Time Taken: 11:30
IEPA Cert. No. 100221

Date Received: 10/30/1998
Time Received: 12:45
WDNR Cert. No. 999447130

Parameter	Results		Units	Date of Analysis	Method PQL	Analyst	Batch No. Prep/Run		Analytical Method
Benzo(k)fluoranthene	<0.015	MX	mg/kg dw	11/09/1998	0.0039	keh	769	1834	SW 8310
Benzo(a)pyrene	0.032		mg/kg dw	11/09/1998	0.0053	keh	769	1834	SW 8310
Benzo(ghi)perylene	<0.046		mg/kg dw	11/09/1998	0.046	keh	769	1834	SW 8310
Chrysene	<0.03		mg/kg dw	11/09/1998	0.03	keh	769	1834	SW 8310
Dibenzo(a,h)anthracene	<0.007		mg/kg dw	11/09/1998	0.007	keh	769	1834	SW 8310
Fluoranthene	<0.10	MX	mg/kg dw	11/09/1998	0.023	keh	769	1834	SW 8310
Fluorene	<0.044	MX	mg/kg dw	11/09/1998	0.023	keh	769	1834	SW 8310
Indeno(1,2,3-cd)pyrene	<0.0099		mg/kg dw	11/09/1998	0.0099	keh	769	1834	SW 8310
Naphthalene	0.11		mg/kg dw	11/09/1998	0.029	keh	769	1834	SW 8310
Phenanthrene	0.14		mg/kg dw	11/09/1998	0.046	keh	769	1834	SW 8310
Pyrene	<0.046	MX	mg/kg dw	11/09/1998	0.023	keh	769	1834	SW 8310
Surr: p-Terphenyl	Masked			11/09/1998	43-125	keh	769	1834	SW 8310
PCB Non-Aqueous Extraction	COMPLETE			11/04/1998	COMPLETE	mmv	382		SW 3540C
PCB'S NON-AQUEOUS									
PCB-1016	<0.046		mg/kg dw	11/07/1998	0.046	tls	382	58	SW 8082
PCB-1221	<0.046		mg/kg dw	11/07/1998	0.046	tls	382	58	SW 8082
PCB-1232	<0.046		mg/kg dw	11/07/1998	0.046	tls	382	58	SW 8082
PCB-1242	<0.046		mg/kg dw	11/07/1998	0.046	tls	382	58	SW 8082
PCB-1248	<0.046		mg/kg dw	11/07/1998	0.046	tls	382	58	SW 8082
PCB-1254	<0.046		mg/kg dw	11/07/1998	0.046	tls	382	58	SW 8082
PCB-1260	1.02		mg/kg dw	11/09/1998	0.046	tls	382	61	SW 8082
Decachlorobiphenyl (Surr)	70.0		%	11/07/1998	NA	tls	382	58	SW 8082
2,4,5,6-TCMX (Surr)	68.0		%	11/07/1998	NA	tls	382	58	SW 8082

MX : Dilution required due to sample matrix; analyte is not detected.

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ANALYTICAL REPORT

Mr. Wei-Lin Feng
ENSR
740 Pasquinelli Drive
Westmont, IL 60559

11/11/1998

Sample No. : 500673

NET Job No.: 98.14072

Sample Description: B-17 (0-4')
ComEd-Waukegan; 1801-023-210

Date Taken: 10/29/1998
Time Taken: 12:55
IEPA Cert. No. 100221

Date Received: 10/30/1998
Time Received: 12:45
WDNR Cert. No. 999447130

Parameter	Results		Units	Date of Analysis	Method PQL	Analyst	Batch No. Prep/Run		Analytical Method
pH, Non-Aqueous	8.50		units	11/06/1998	0.10	nwg		197	SW 9045B
Solids, Total	93.8		%	11/04/1998	0.1	aks		2528	SM 2540
Arsenic, GFAA	5.0		mg/kg dw	11/09/1998	0.53	jtt	236	674	SW 7060
Barium, ICP	267		mg/kg dw	11/07/1998	1.1	jtt	1169	2188	SW 6010B
Cadmium, ICP	0.75		mg/kg dw	11/06/1998	0.53	jtt	1169	2174	SW 6010B
Chromium, ICP	128		mg/kg dw	11/06/1998	2.1	jtt	1169	2159	SW 6010B
Lead, ICP	27		mg/kg dw	11/06/1998	4.3	jtt	1169	2397	SW 6010B
Mercury, CVAA	<0.043		mg/kg dw	11/10/1998	0.043	sep	668	772	SW 7471A
Selenium, GFAA	<0.27		mg/kg dw	11/08/1998	0.27	jtt	236	562	SW 7740
Silver, AA	<2.1		mg/kg dw	11/04/1998	2.1	sep	494	571	SW 7760
UST VOLATILES NON-AQUEOUS									
Benzene	<0.005		mg/kg dw	11/06/1998	0.005	jap		78	SW 8260A
Ethylbenzene	<0.005		mg/kg dw	11/06/1998	0.005	jap		78	SW 8260A
Toluene	<0.005		mg/kg dw	11/06/1998	0.005	jap		78	SW 8260A
Xylenes, Total	<0.005		mg/kg dw	11/06/1998	0.005	jap		78	SW 8260A
Dibromofluoromethane (Surr)	99.8		%	11/06/1998	81-129	jap		78	SW 8260A
Toluene-d8 (Surr)	88.2		%	11/06/1998	74-129	jap		78	SW 8260A
4-Bromofluoromethane (Surr)	85.2		%	11/06/1998	70-130	jap		78	SW 8260A
Prep, 8310 PNAs NON-AQUEOUS	extracted			11/05/1998		mmv	769		SW 3540C
PNA CMPDS - 8310 NONAQUEOUS									
Acenaphthene	<0.021		mg/kg dw	11/09/1998	0.021	keh	769	1834	SW 8310
Acenaphthylene	<0.021		mg/kg dw	11/09/1998	0.021	keh	769	1834	SW 8310
Anthracene	<0.043		mg/kg dw	11/09/1998	0.043	keh	769	1834	SW 8310
Benzo(a)anthracene	<0.067	MX	mg/kg dw	11/09/1998	0.0028	keh	769	1834	SW 8310
Benzo(b)fluoranthene	0.019		mg/kg dw	11/09/1998	0.0038	keh	769	1834	SW 8310

MX : Dilution required due to sample matrix; analyte is not detected.

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ANALYTICAL REPORT

Mr. Wei-Lin Feng
ENSR
740 Pasquinelli Drive
Westmont, IL 60559

11/11/1998

Sample No. : 500673

NET Job No.: 98.14072

Sample Description: B-17 (0-4')
ComEd-Waukegan; 1801-023-210

Date Taken: 10/29/1998
Time Taken: 12:55
IEPA Cert. No. 100221

Date Received: 10/30/1998
Time Received: 12:45
WDNR Cert. No. 999447130

Parameter	Results		Units	Date of Analysis	Method PQL	Analyst	Batch No. Prep/Run		Analytical Method
Benzo(k)fluoranthene	<0.032	MX	mg/kg dw	11/09/1998	0.0036	keh	769	1834	SW 8310
Benzo(a)pyrene	0.015		mg/kg dw	11/09/1998	0.0049	keh	769	1834	SW 8310
Benzo(ghi)perylene	<0.043		mg/kg dw	11/09/1998	0.043	keh	769	1834	SW 8310
Chrysene	<0.03		mg/kg dw	11/09/1998	0.03	keh	769	1834	SW 8310
Dibenzo(a,h)anthracene	<0.006		mg/kg dw	11/09/1998	0.006	keh	769	1834	SW 8310
Fluoranthene	<0.057	MX	mg/kg dw	11/09/1998	0.021	keh	769	1834	SW 8310
Fluorene	<0.021		mg/kg dw	11/09/1998	0.021	keh	769	1834	SW 8310
Indeno(1,2,3-cd)pyrene	<0.0092		mg/kg dw	11/09/1998	0.0092	keh	769	1834	SW 8310
Naphthalene	0.10		mg/kg dw	11/09/1998	0.027	keh	769	1834	SW 8310
Phenanthrene	0.082		mg/kg dw	11/09/1998	0.043	keh	769	1834	SW 8310
Pyrene	<0.034	MX	mg/kg dw	11/09/1998	0.021	keh	769	1834	SW 8310
Surr: p-Terphenyl	102.3		%	11/09/1998	43-125	keh	769	1834	SW 8310
PCB Non-Aqueous Extraction	COMPLETE			11/04/1998	COMPLETE	mmv	382		SW 3540C
PCB'S NON-AQUEOUS									
PCB-1016	<0.043		mg/kg dw	11/07/1998	0.043	tls	382	58	SW 8082
PCB-1221	<0.043		mg/kg dw	11/07/1998	0.043	tls	382	58	SW 8082
PCB-1232	<0.043		mg/kg dw	11/07/1998	0.043	tls	382	58	SW 8082
PCB-1242	<0.043		mg/kg dw	11/07/1998	0.043	tls	382	58	SW 8082
PCB-1248	<0.043		mg/kg dw	11/07/1998	0.043	tls	382	58	SW 8082
PCB-1254	<0.043		mg/kg dw	11/07/1998	0.043	tls	382	58	SW 8082
PCB-1260	<0.043		mg/kg dw	11/07/1998	0.043	tls	382	58	SW 8082
Decachlorobiphenyl (Surr)	77.0		%	11/07/1998	NA	tls	382	58	SW 8082
2,4,5,6-TCMX (Surr)	82.0		%	11/07/1998	NA	tls	382	58	SW 8082

MX : Dilution required due to sample matrix; analyte is not detected.

MWG13-15_46004

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ANALYTICAL REPORT

Mr. Wei-Lin Feng
ENSR
740 Pasquinelli Drive
Westmont, IL 60559

11/11/1998

Sample No. : 500674

NET Job No.: 98.14072

Sample Description: S-11
ComEd-Waukegan; 1801-023-210

Date Taken: 10/29/1998
Time Taken: 13:45
IEPA Cert. No. 100221

Date Received: 10/30/1998
Time Received: 12:45
WDNR Cert. No. 999447130

Parameter	Results	Units	Date of Analysis	Method PQL	Analyst	Batch No. Prep/Run	Analytical Method
pH, Non-Aqueous	7.61	units	11/06/1998	0.10	nwg	197	SW 9045B
Solids, Total	61.8	%	11/04/1998	0.1	aks	2528	SM 2540
Arsenic, GFAA	29	mg/kg dw	11/09/1998	0.81	jtt	236 674	SW 7060
Barium, ICP	1,230	mg/kg dw	11/07/1998	1.6	jtt	1169 2188	SW 6010B
Cadmium, ICP	18	mg/kg dw	11/06/1998	0.81	jtt	1169 2174	SW 6010B
Chromium, ICP	150	mg/kg dw	11/06/1998	3.2	jtt	1169 2159	SW 6010B
Lead, ICP	1,340	mg/kg dw	11/06/1998	6.5	jtt	1169 2397	SW 6010B
Mercury, CVAA	0.15	mg/kg dw	11/10/1998	0.065	sep	668 772	SW 7471A
Selenium, GFAA	2.6	mg/kg dw	11/08/1998	0.40	jtt	236 562	SW 7740
Silver, AA	<3.2	mg/kg dw	11/04/1998	3.2	sep	494 571	SW 7760
Prep, TPH 8015M - NONAQUEOUS	extracted		11/03/1998		mmv	246	SW 8015M
TPH MODIFIED 8015							
TPH as Gas	<809	mg/kg dw	11/05/1998	81	out	246 490	SW 8015M
TPH as Diesel	<809	mg/kg dw	11/05/1998	81	out	246 490	SW 8015M
TPH as Oil	65,000 PT	mg/kg dw	11/05/1998	81	out	246 490	SW 8015M
N-octacosane (TPH surr)	Diluted out	mg/kg dw	11/05/1998		out	246 490	SW 8015M
UST VOLATILES NON-AQUEOUS							
Benzene	<0.008	mg/kg dw	11/06/1998	0.008	jap	78	SW 8260A
Ethylbenzene	<0.008	mg/kg dw	11/06/1998	0.008	jap	78	SW 8260A
Toluene	<0.008	mg/kg dw	11/06/1998	0.008	jap	78	SW 8260A
Xylenes, Total	<0.008	mg/kg dw	11/06/1998	0.008	jap	78	SW 8260A
Dibromofluoromethane (Surr)	97.8	%	11/06/1998	81-129	jap	78	SW 8260A
Toluene-d8 (Surr)	81.0	%	11/06/1998	74-129	jap	78	SW 8260A
4-Bromofluoromethane (Surr)	84.2	%	11/06/1998	70-130	jap	78	SW 8260A
Prep, 8310 PNAs NON-AQUEOUS	extracted		11/05/1998		mmv	769	SW 3540C

PT : Pattern does not match the calibration standard; however, hydrocarbons are present in the oil range.

NATIONAL ENVIRONMENTAL TESTING, INC.

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ANALYTICAL REPORT

Mr. Wei-Lin Feng
ENSR
740 Pasquinelli Drive
Westmont, IL 60559

11/11/1998

Sample No. : 500674

NET Job No.: 98.14072

Sample Description: S-11
ComEd-Waukegan; 1801-023-210

Date Taken: 10/29/1998
Time Taken: 13:45
IEPA Cert. No. 100221

Date Received: 10/30/1998
Time Received: 12:45
WDNR Cert. No. 999447130

Parameter	Results		Units	Date of Analysis	Method PQL	Analyst	Batch No. Prep/Run		Analytical Method
PNA CMPDS - 8310 NONAQUEOUS		ELV							
Acenaphthene	<0.32		mg/kg dw	11/09/1998	0.032	keh	769	1834	SW 8310
Acenaphthylene	<0.32		mg/kg dw	11/09/1998	0.032	keh	769	1834	SW 8310
Anthracene	<0.65		mg/kg dw	11/09/1998	0.065	keh	769	1834	SW 8310
Benzo(a)anthracene	<0.39		mg/kg dw	11/09/1998	0.0042	keh	769	1834	SW 8310
Benzo(b)fluoranthene	0.079		mg/kg dw	11/09/1998	0.0058	keh	769	1834	SW 8310
Benzo(k)fluoranthene	0.099		mg/kg dw	11/09/1998	0.0055	keh	769	1834	SW 8310
Benzo(a)pyrene	0.11		mg/kg dw	11/09/1998	0.0074	keh	769	1834	SW 8310
Benzo(ghi)perylene	<0.65		mg/kg dw	11/09/1998	0.065	keh	769	1834	SW 8310
Chrysene	<0.5		mg/kg dw	11/09/1998	0.05	keh	769	1834	SW 8310
Dibenzo(a,h)anthracene	<0.1		mg/kg dw	11/09/1998	0.01	keh	769	1834	SW 8310
Fluoranthene	<0.32		mg/kg dw	11/09/1998	0.032	keh	769	1834	SW 8310
Fluorene	<0.32		mg/kg dw	11/09/1998	0.032	keh	769	1834	SW 8310
Indeno(1,2,3-cd)pyrene	<0.14		mg/kg dw	11/09/1998	0.014	keh	769	1834	SW 8310
Naphthalene	<0.40		mg/kg dw	11/09/1998	0.040	keh	769	1834	SW 8310
Phenanthrene	0.66		mg/kg dw	11/09/1998	0.065	keh	769	1834	SW 8310
Pyrene	<0.32		mg/kg dw	11/09/1998	0.032	keh	769	1834	SW 8310
Surr: p-Terphenyl	Masked			11/09/1998	43-125	keh	769	1834	SW 8310
PCB Non-Aqueous Extraction	COMPLETE			11/04/1998	COMPLETE	mmv	382		SW 3540C
PCB'S NON-AQUEOUS		ELV							
PCB-1016	<0.1		mg/kg dw	11/09/1998	0.065	tls	382	61	SW 8082
PCB-1221	<0.1		mg/kg dw	11/09/1998	0.065	tls	382	61	SW 8082
PCB-1232	<0.1		mg/kg dw	11/09/1998	0.065	tls	382	61	SW 8082
PCB-1242	<0.1		mg/kg dw	11/09/1998	0.065	tls	382	61	SW 8082
PCB-1248	<0.1		mg/kg dw	11/09/1998	0.065	tls	382	61	SW 8082
PCB-1254	<0.1		mg/kg dw	11/09/1998	0.065	tls	382	61	SW 8082

ELV : Elevated reporting limits due to matrix interference.

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ANALYTICAL REPORT

Mr. Wei-Lin Feng
ENSR
740 Pasquinelli Drive
Westmont, IL 60559

11/11/1998

Sample No. : 500674

NET Job No.: 98.14072

Sample Description: S-11
ComEd-Waukegan; 1801-023-210

Date Taken: 10/29/1998
Time Taken: 13:45
IEPA Cert. No. 100221

Date Received: 10/30/1998
Time Received: 12:45
WDNR Cert. No. 999447130

Parameter	Results	Units	Date of Analysis	Method PQL	Analyst	Batch No. Prep/Run	Analytical Method
PCB-1260	0.79	mg/kg dw	11/09/1998	0.065	tls	382 61	SW 8082
Decachlorobiphenyl (Surr)	99.0	%	11/09/1998	NA	tls	382 61	SW 8082
2,4,5,6-TCMX (Surr)	82.0	%	11/09/1998	NA	tls	382 61	SW 8082

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ANALYTICAL REPORT

Mr. Wei-Lin Feng
ENSR
740 Pasquinelli Drive
Westmont, IL 60559

11/11/1998

Sample No. : 500675

NET Job No.: 98.14072

Sample Description: X-4
ComEd-Waukegan; 1801-023-210

Date Taken: 10/29/1998
Time Taken: 14:10
IEPA Cert. No. 100221

Date Received: 10/30/1998
Time Received: 12:45
WDNR Cert. No. 999447130

Parameter	Results		Units	Date of Analysis	Method PQL	Analyst	Batch No. Prep/Run		Analytical Method
pH, Non-Aqueous	7.38		units	11/06/1998	0.10	nwg		197	SW 9045B
Solids, Total	37.0		%	11/04/1998	0.1	aks		2528	SM 2540
Arsenic, GFAA	35		mg/kg dw	11/09/1998	1.4	jtt	238	674	SW 7060
Barium, ICP	892		mg/kg dw	11/10/1998	2.7	kdw	1172	2194	SW 6010B
Cadmium, ICP	<2.5	MX	mg/kg dw	11/09/1998	1.4	kdw	1172	2178	SW 6010B
Chromium, ICP	15		mg/kg dw	11/09/1998	5.4	kdw	1172	2163	SW 6010B
Lead, ICP	26		mg/kg dw	11/09/1998	11	kdw	1172	2401	SW 6010B
Mercury, CVAA	0.15		mg/kg dw	11/10/1998	0.11	sep	668	772	SW 7471A
Selenium, GFAA	0.76		mg/kg dw	11/08/1998	0.68	jtt	238	562	SW 7740
Silver, AA	<5.4		mg/kg dw	11/06/1998	5.4	sep	496	572	SW 7760
Prep, TPH 8015M - NONAQUEOUS	extracted			11/03/1998		mmv	246		SW 8015M
TPH MODIFIED 8015									
TPH as Gas	<140		mg/kg dw	11/05/1998	140	out	246	490	SW 8015M
TPH as Diesel	<140		mg/kg dw	11/05/1998	140	out	246	490	SW 8015M
TPH as Oil	10,900	PT	mg/kg dw	11/05/1998	140	out	246	490	SW 8015M
N-octacosane (TPH surr)	79.0		%	11/05/1998		out	246	490	SW 8015M
UST VOLATILES NON-AQUEOUS									
Benzene	<0.01		mg/kg dw	11/07/1998	0.01	mjo		79	SW 8260A
Ethylbenzene	<0.01		mg/kg dw	11/07/1998	0.01	mjo		79	SW 8260A
Toluene	<0.01		mg/kg dw	11/07/1998	0.01	mjo		79	SW 8260A
Xylenes, Total	<0.01		mg/kg dw	11/07/1998	0.01	mjo		79	SW 8260A
Dibromofluoromethane (Surr)	93.4		%	11/07/1998	81-129	mjo		79	SW 8260A
Toluene-d8 (Surr)	75.6		%	11/07/1998	74-129	mjo		79	SW 8260A
4-Bromofluoromethane (Surr)	73.6		%	11/07/1998	70-130	mjo		79	SW 8260A
Prep, 8310 PNAs NON-AQUEOUS	extracted			11/05/1998		mmv	769		SW 3540C

MX : Dilution required due to sample matrix; analyte is not detected.
PT : Pattern does not match the calibration standard; however, hydrocarbons are present in the oil range.

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ANALYTICAL REPORT

Mr. Wei-Lin Feng
ENSR
740 Pasquinelli Drive
Westmont, IL 60559

11/11/1998

Sample No. : 500675

NET Job No.: 98.14072

Sample Description: X-4
ComEd-Waukegan; 1801-023-210

Date Taken: 10/29/1998
Time Taken: 14:10
IEPA Cert. No. 100221

Date Received: 10/30/1998
Time Received: 12:45
WDNR Cert. No. 999447130

Parameter	Results	Units	Date of Analysis	Method PQL	Analyst	Batch No. Prep/Run		Analytical Method
PNA CMPDS - 8310 NONAQUEOUS	ELV							
Acenaphthene	<0.3	mg/kg dw	11/10/1998	0.054	keh	769	1834	SW 8310
Acenaphthylene	<0.3	mg/kg dw	11/10/1998	0.054	keh	769	1834	SW 8310
Anthracene	<0.6	mg/kg dw	11/10/1998	0.11	keh	769	1834	SW 8310
Benzo(a)anthracene	<2.0	mg/kg dw	11/10/1998	0.0070	keh	769	1834	SW 8310
Benzo(b)fluoranthene	<0.57	mg/kg dw	11/10/1998	0.0097	keh	769	1834	SW 8310
Benzo(k)fluoranthene	<0.70	mg/kg dw	11/10/1998	0.0092	keh	769	1834	SW 8310
Benzo(a)pyrene	<0.49	mg/kg dw	11/10/1998	0.012	keh	769	1834	SW 8310
Benzo(ghi)perylene	<0.6	mg/kg dw	11/10/1998	0.11	keh	769	1834	SW 8310
Chrysene	<0.4	mg/kg dw	11/10/1998	0.08	keh	769	1834	SW 8310
Dibenzo(a,h)anthracene	<0.1	mg/kg dw	11/10/1998	0.02	keh	769	1834	SW 8310
Fluoranthene	<0.3	mg/kg dw	11/10/1998	0.054	keh	769	1834	SW 8310
Fluorene	<0.57	mg/kg dw	11/10/1998	0.054	keh	769	1834	SW 8310
Indeno(1,2,3-cd)pyrene	<0.1	mg/kg dw	11/10/1998	0.023	keh	769	1834	SW 8310
Naphthalene	<0.3	mg/kg dw	11/10/1998	0.068	keh	769	1834	SW 8310
Phenanthrene	<0.6	mg/kg dw	11/10/1998	0.11	keh	769	1834	SW 8310
Pyrene	0.32	mg/kg dw	11/10/1998	0.054	keh	769	1834	SW 8310
Surr: p-Terphenyl	Masked		11/10/1998	43-125	keh	769	1834	SW 8310
PCB Non-Aqueous Extraction	COMPLETE		11/04/1998	COMPLETE	mmv	382		SW 3540C
PCB'S NON-AQUEOUS								
PCB-1016	<0.11	mg/kg dw	11/07/1998	0.11	tls	382	58	SW 8082
PCB-1221	<0.11	mg/kg dw	11/07/1998	0.11	tls	382	58	SW 8082
PCB-1232	<0.11	mg/kg dw	11/07/1998	0.11	tls	382	58	SW 8082
PCB-1242	<0.11	mg/kg dw	11/07/1998	0.11	tls	382	58	SW 8082
PCB-1248	<0.11	mg/kg dw	11/07/1998	0.11	tls	382	58	SW 8082
PCB-1254	<0.11	mg/kg dw	11/07/1998	0.11	tls	382	58	SW 8082

ELV : Elevated reporting limits due to matrix interference.

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ANALYTICAL REPORT

Mr. Wei-Lin Feng
ENSR
740 Pasquinelli Drive
Westmont, IL 60559

11/11/1998

Sample No. : 500675

NET Job No.: 98.14072

Sample Description: X-4
ComEd-Waukegan; 1801-023-210

Date Taken: 10/29/1998
Time Taken: 14:10
IEPA Cert. No. 100221

Date Received: 10/30/1998
Time Received: 12:45
WDNR Cert. No. 999447130

Parameter	Results	Units	Date of Analysis	Method PQL	Analyst	Batch No. Prep/Run		Analytical Method
PCB-1260	<0.11	mg/kg dw	11/07/1998	0.11	tls	382	58	SW 8082
Decachlorobiphenyl (Surr)	69.0	%	11/07/1998	NA	tls	382	58	SW 8082
2,4,5,6-TCMX (Surr)	80.0	%	11/07/1998	NA	tls	382	58	SW 8082

MWG13-15_46010

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ANALYTICAL REPORT

Mr. Wei-Lin Feng
ENSR
740 Pasquinelli Drive
Westmont, IL 60559

11/11/1998

Sample No. : 500676

NET Job No.: 98.14072

Sample Description: X-1
ComEd-Waukegan; 1801-023-210

Date Taken: 10/29/1998
Time Taken: 14:30
IEPA Cert. No. 100221

Date Received: 10/30/1998
Time Received: 12:45
WDNR Cert. No. 999447130

Parameter	Results		Units	Date of Analysis	Method PQL	Analyst	Batch No. Prep/Run		Analytical Method
pH, Non-Aqueous	7.99		units	11/06/1998	0.10	nwg		197	SW 9045B
Solids, Total	28.9		%	11/04/1998	0.1	aks		2528	SM 2540
Arsenic, GFAA	69		mg/kg dw	11/09/1998	1.7	jtt	238	674	SW 7060
Barium, ICP	190		mg/kg dw	11/10/1998	3.5	kdw	1172	2194	SW 6010B
Cadmium, ICP	<3.1	MX	mg/kg dw	11/09/1998	1.7	kdw	1172	2178	SW 6010B
Chromium, ICP	19		mg/kg dw	11/09/1998	6.9	kdw	1172	2163	SW 6010B
Lead, ICP	415		mg/kg dw	11/09/1998	14	kdw	1172	2401	SW 6010B
Mercury, CVAA	0.25		mg/kg dw	11/10/1998	0.14	sep	668	772	SW 7471A
Selenium, GFAA	<0.87		mg/kg dw	11/08/1998	0.87	jtt	238	562	SW 7740
Silver, AA	<6.9		mg/kg dw	11/06/1998	6.9	sep	496	572	SW 7760
Prep, TPH 8015M - NONAQUEOUS	extracted			11/03/1998		mmv	246		SW 8015M
TPH MODIFIED 8015									
TPH as Gas	<170		mg/kg dw	11/05/1998	170	out	246	490	SW 8015M
TPH as Diesel	17,800	PT	mg/kg dw	11/05/1998	170	out	246	490	SW 8015M
TPH as Oil	<170		mg/kg dw	11/05/1998	170	out	246	490	SW 8015M
N-octacosane (TPH surr)	135.0		%	11/05/1998		out	246	490	SW 8015M
UST VOLATILES NON-AQUEOUS									
Benzene	<0.02		mg/kg dw	11/08/1998	0.02	mjo		80	SW 8260A
Ethylbenzene	<0.02		mg/kg dw	11/08/1998	0.02	mjo		80	SW 8260A
Toluene	<0.02		mg/kg dw	11/08/1998	0.02	mjo		80	SW 8260A
Xylenes, Total	<0.02		mg/kg dw	11/08/1998	0.02	mjo		80	SW 8260A
Dibromofluoromethane (Surr)	89.4		%	11/08/1998	81-129	mjo		80	SW 8260A
Toluene-d8 (Surr)	90.2		%	11/08/1998	74-129	mjo		80	SW 8260A
4-Bromofluoromethane (Surr)	93.8		%	11/08/1998	70-130	mjo		80	SW 8260A
Prep, 8310 PNAs NON-AQUEOUS	extracted			11/05/1998		mmv	769		SW 3540C

MX : Dilution required due to sample matrix; analyte is not detected.
PT : Pattern does not match the calibration standard; however, hydrocarbons are present in the diesel range.

MWG13-15_46011

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ANALYTICAL REPORT

Mr. Wei-Lin Feng
ENSR
740 Pasquinelli Drive
Westmont, IL 60559

11/11/1998

Sample No. : 500676

NET Job No.: 98.14072

Sample Description: X-1
ComEd-Waukegan; 1801-023-210

Date Taken: 10/29/1998
Time Taken: 14:30
IEPA Cert. No. 100221

Date Received: 10/30/1998
Time Received: 12:45
WDNR Cert. No. 999447130

Parameter	Results	Units	Date of Analysis	Method PQL	Analyst	Batch No. Prep/Run		Analytical Method
PNA CMPDS - 8310 NONAQUEOUS	ELV							
Acenaphthene	<0.069	mg/kg dw	11/10/1998	0.069	keh	769	1834	SW 8310
Acenaphthylene	<0.069	mg/kg dw	11/10/1998	0.069	keh	769	1834	SW 8310
Anthracene	<0.27	mg/kg dw	11/10/1998	0.14	keh	769	1834	SW 8310
Benzo(a)anthracene	<0.17	mg/kg dw	11/10/1998	0.0090	keh	769	1834	SW 8310
Benzo(b)fluoranthene	<0.093	mg/kg dw	11/10/1998	0.012	keh	769	1834	SW 8310
Benzo(k)fluoranthene	<0.13	mg/kg dw	11/10/1998	0.012	keh	769	1834	SW 8310
Benzo(a)pyrene	<0.066	mg/kg dw	11/10/1998	0.016	keh	769	1834	SW 8310
Benzo(ghi)perylene	<0.14	mg/kg dw	11/10/1998	0.14	keh	769	1834	SW 8310
Chrysene	<0.55	mg/kg dw	11/10/1998	0.1	keh	769	1834	SW 8310
Dibenzo(a,h)anthracene	<0.02	mg/kg dw	11/10/1998	0.02	keh	769	1834	SW 8310
Fluoranthene	<1.3	mg/kg dw	11/10/1998	0.069	keh	769	1834	SW 8310
Fluorene	<0.59	mg/kg dw	11/10/1998	0.069	keh	769	1834	SW 8310
Indeno(1,2,3-cd)pyrene	0.031	mg/kg dw	11/10/1998	0.030	keh	769	1834	SW 8310
Naphthalene	<0.087	mg/kg dw	11/10/1998	0.087	keh	769	1834	SW 8310
Phenanthrene	<0.14	mg/kg dw	11/10/1998	0.14	keh	769	1834	SW 8310
Pyrene	<1.9	mg/kg dw	11/10/1998	0.069	keh	769	1834	SW 8310
Surr: p-Terphenyl	Masked		11/10/1998	43-125	keh	769	1834	SW 8310
PCB Non-Aqueous Extraction	COMPLETE		11/04/1998	COMPLETE	mmv	382		SW 3540C
PCB'S NON-AQUEOUS								
PCB-1016	<0.14	mg/kg dw	11/07/1998	0.14	tls	382	58	SW 8082
PCB-1221	<0.14	mg/kg dw	11/07/1998	0.14	tls	382	58	SW 8082
PCB-1232	<0.14	mg/kg dw	11/07/1998	0.14	tls	382	58	SW 8082
PCB-1242	<0.14	mg/kg dw	11/07/1998	0.14	tls	382	58	SW 8082
PCB-1248	<0.14	mg/kg dw	11/07/1998	0.14	tls	382	58	SW 8082
PCB-1254	0.17	mg/kg dw	11/07/1998	0.14	tls	382	58	SW 8082

ELV :Elevated reporting limits due to matrix interference.

MWG13-15_46013

NATIONAL ENVIRONMENTAL TESTING, INC.

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(800) 807-2877

ANALYTICAL REPORT

Mr. Wei-Lin Feng
ENSR
740 Pasquinelli Drive
Westmont, IL 60559

11/11/1998

Sample No. : 500676

NET Job No.: 98.14072

Sample Description: X-1
ComEd-Waukegan; 1801-023-210

Date Taken: 10/29/1998
Time Taken: 14:30
IEPA Cert. No. 100221

Date Received: 10/30/1998
Time Received: 12:45
WDNR Cert. No. 999447130

Parameter	Results	Units	Date of Analysis	Method PQL	Analyst	Batch No. Prep/Run		Analytical Method
PCB-1260	<0.14	mg/kg dw	11/07/1998	0.14	tls	382	58	SW 8082
Decachlorobiphenyl (Surr)	87.0	%	11/07/1998	NA	tls	382	58	SW 8082
2,4,5,6-TCMX (Surr)	67.0	%	11/07/1998	NA	tls	382	58	SW 8082

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ANALYTICAL REPORT

Mr. Wei-Lin Feng
ENSR
740 Pasquinelli Drive
Westmont, IL 60559

11/11/1998

Sample No. : 500677

NET Job No.: 98.14072

Sample Description: X-2
ComEd-Waukegan; 1801-023-210

Date Taken: 10/29/1998
Time Taken: 14:40
IEPA Cert. No. 100221

Date Received: 10/30/1998
Time Received: 12:45
WDNR Cert. No. 999447130

Parameter	Results		Units	Date of Analysis	Method PQL	Analyst	Batch No. Prep/Run		Analytical Method
pH, Non-Aqueous	7.78		units	11/06/1998	0.10	nwg		197	SW 9045B
Solids, Total	55.9		%	11/04/1998	0.1	aks		2528	SM 2540
Arsenic, GFAA	16		mg/kg dw	11/09/1998	0.89	mhp	239	675	SW 7060
Barium, ICP	160		mg/kg dw	11/10/1998	1.8	kdw	1172	2194	SW 6010B
Cadmium, ICP	1.7		mg/kg dw	11/09/1998	0.89	kdw	1172	2178	SW 6010B
Chromium, ICP	38		mg/kg dw	11/09/1998	3.6	kdw	1172	2163	SW 6010B
Lead, ICP	30		mg/kg dw	11/09/1998	7.2	kdw	1172	2401	SW 6010B
Mercury, CVAA	<0.072		mg/kg dw	11/10/1998	0.072	sep	668	772	SW 7471A
Selenium, GFAA	<0.45		mg/kg dw	11/09/1998	0.45	mhp	239	563	SW 7740
Silver, AA	<3.6		mg/kg dw	11/06/1998	3.6	sep	496	572	SW 7760
Prep, TPH 8015M - NONAQUEOUS	extracted			11/03/1998		mmv	246		SW 8015M
TPH MODIFIED 8015									
TPH as Gas	<89		mg/kg dw	11/05/1998	89	out	246	490	SW 8015M
TPH as Diesel	630	PT	mg/kg dw	11/05/1998	89	out	246	490	SW 8015M
TPH as Oil	<89		mg/kg dw	11/05/1998	89	out	246	490	SW 8015M
N-octacosane (TPH surr)	84.0		%	11/05/1998		out	246	490	SW 8015M
UST VOLATILES NON-AQUEOUS									
Benzene	<0.009		mg/kg dw	11/07/1998	0.009	mjo		79	SW 8260A
Ethylbenzene	<0.009		mg/kg dw	11/07/1998	0.009	mjo		79	SW 8260A
Toluene	<0.009		mg/kg dw	11/07/1998	0.009	mjo		79	SW 8260A
Xylenes, Total	<0.009		mg/kg dw	11/07/1998	0.009	mjo		79	SW 8260A
Dibromofluoromethane (Surr)	88.0		%	11/07/1998	81-129	mjo		79	SW 8260A
Toluene-d8 (Surr)	86.2		%	11/07/1998	74-129	mjo		79	SW 8260A
4-Bromofluoromethane (Surr)	86.6		%	11/07/1998	70-130	mjo		79	SW 8260A
Prep, 8310 PNAs NON-AQUEOUS	extracted			11/05/1998		mmv	769		SW 3540C

PT : Pattern does not match the calibration standard; however, hydrocarbons are present in the diesel range.

MWG13-15_46015

NATIONAL ENVIRONMENTAL TESTING, INC.

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Fax: (815) 874-5622
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ANALYTICAL REPORT

Mr. Wei-Lin Feng
ENSR
740 Pasquinelli Drive
Westmont, IL 60559

11/11/1998

Sample No. : 500677

NET Job No.: 98.14072

Sample Description: X-2
ComEd-Waukegan; 1801-023-210

Date Taken: 10/29/1998
Time Taken: 14:40
IEPA Cert. No. 100221

Date Received: 10/30/1998
Time Received: 12:45
WDNR Cert. No. 999447130

Parameter	Results		Units	Date of Analysis	Method PQL	Analyst	Batch No. Prep/Run		Analytical Method
PNA CMPDS - 8310 NONAQUEOUS									
Acenaphthene	<0.036		mg/kg dw	11/10/1998	0.036	keh	769	1834	SW 8310
Acenaphthylene	<0.036		mg/kg dw	11/10/1998	0.036	keh	769	1834	SW 8310
Anthracene	<0.072		mg/kg dw	11/10/1998	0.072	keh	769	1834	SW 8310
Benzo(a)anthracene	<0.036	MX	mg/kg dw	11/10/1998	0.0047	keh	769	1834	SW 8310
Benzo(b)fluoranthene	<0.0064		mg/kg dw	11/10/1998	0.0064	keh	769	1834	SW 8310
Benzo(k)fluoranthene	0.0081		mg/kg dw	11/10/1998	0.0061	keh	769	1834	SW 8310
Benzo(a)pyrene	<0.014	MX	mg/kg dw	11/10/1998	0.0082	keh	769	1834	SW 8310
Benzo(ghi)perylene	<0.072		mg/kg dw	11/10/1998	0.072	keh	769	1834	SW 8310
Chrysene	<0.05		mg/kg dw	11/10/1998	0.05	keh	769	1835	SW 8310
Dibenzo(a,h)anthracene	<0.01		mg/kg dw	11/10/1998	0.01	keh	769	1834	SW 8310
Fluoranthene	<0.036		mg/kg dw	11/10/1998	0.036	keh	769	1834	SW 8310
Fluorene	<0.036		mg/kg dw	11/10/1998	0.036	keh	769	1834	SW 8310
Indeno(1,2,3-cd)pyrene	<0.015		mg/kg dw	11/10/1998	0.015	keh	769	1834	SW 8310
Naphthalene	0.15		mg/kg dw	11/10/1998	0.045	keh	769	1834	SW 8310
Phenanthrene	<0.072		mg/kg dw	11/10/1998	0.072	keh	769	1834	SW 8310
Pyrene	<0.036		mg/kg dw	11/10/1998	0.036	keh	769	1834	SW 8310
Surr: p-Terphenyl	73.9		%	11/10/1998	43-125	keh	769	1834	SW 8310
PCB Non-Aqueous Extraction	COMPLETE			11/05/1998	COMPLETE	mmv	382		SW 3540C
PCB'S NON-AQUEOUS									
PCB-1016	<0.072		mg/kg dw	11/07/1998	0.072	tls	382	58	SW 8082
PCB-1221	<0.072		mg/kg dw	11/07/1998	0.072	tls	382	58	SW 8082
PCB-1232	<0.072		mg/kg dw	11/07/1998	0.072	tls	382	58	SW 8082
PCB-1242	<0.072		mg/kg dw	11/07/1998	0.072	tls	382	58	SW 8082
PCB-1248	<0.072		mg/kg dw	11/07/1998	0.072	tls	382	58	SW 8082
PCB-1254	<0.072		mg/kg dw	11/07/1998	0.072	tls	382	58	SW 8082

MX : Dilution required due to sample matrix; analyte is not detected.

MWG13-15_46016

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ANALYTICAL REPORT

Mr. Wei-Lin Feng
ENSR
740 Pasquinelli Drive
Westmont, IL 60559

11/11/1998

Sample No. : 500677

NET Job No.: 98.14072

Sample Description: X-2
ComEd-Waukegan; 1801-023-210

Date Taken: 10/29/1998
Time Taken: 14:40
IEPA Cert. No. 100221

Date Received: 10/30/1998
Time Received: 12:45
WDNR Cert. No. 999447130

Parameter	Results	Units	Date of Analysis	Method PQL	Analyst	Batch No. Prep/Run	Analytical Method
PCB-1260	<0.072	mg/kg dw	11/07/1998	0.072	tls	382 58	SW 8082
Decachlorobiphenyl (Surr)	70.0	%	11/07/1998	NA	tls	382 58	SW 8082
2,4,5,6-TCMX (Surr)	96.0	%	11/07/1998	NA	tls	382 58	SW 8082

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ANALYTICAL REPORT

Mr. Wei-Lin Feng
ENSR
740 Pasquinelli Drive
Westmont, IL 60559

11/11/1998

Sample No. : 500678

NET Job No.: 98.14072

Sample Description: S-6
ComEd-Waukegan; 1801-023-210

Date Taken: 10/29/1998
Time Taken: 14:50
IEPA Cert. No. 100221

Date Received: 10/30/1998
Time Received: 12:45
WDNR Cert. No. 999447130

Parameter	Results		Units	Date of Analysis	Method PQL	Analyst	Batch No. Prep/Run		Analytical Method
pH, Non-Aqueous	6.60		units	11/06/1998	0.10	nwg		197	SW 9045B
Solids, Total	95.5		%	11/04/1998	0.1	aks		2528	SM 2540
Arsenic, GFAA	2.8		mg/kg dw	11/09/1998	0.52	mhp	239	675	SW 7060
Barium, ICP	41		mg/kg dw	11/10/1998	1.0	kdw	1173	2194	SW 6010B
Cadmium, ICP	<0.52		mg/kg dw	11/09/1998	0.52	kdw	1173	2178	SW 6010B
Chromium, ICP	4.5		mg/kg dw	11/09/1998	2.1	kdw	1173	2163	SW 6010B
Lead, ICP	8.5		mg/kg dw	11/09/1998	4.2	kdw	1173	2401	SW 6010B
Mercury, CVAA	<0.042		mg/kg dw	11/10/1998	0.042	sep	668	772	SW 7471A
Selenium, GFAA	0.31		mg/kg dw	11/09/1998	0.26	mhp	239	563	SW 7740
Silver, AA	2.2		mg/kg dw	11/06/1998	2.1	sep	496	572	SW 7760
Prep, TPH 8015M - NONAQUEOUS	extracted			11/03/1998		mmv	246		SW 8015M
TPH MODIFIED 8015									
TPH as Gas	<52		mg/kg dw	11/05/1998	52	out	246	490	SW 8015M
TPH as Diesel	5,790	PT	mg/kg dw	11/05/1998	52	out	246	490	SW 8015M
TPH as Oil	<52		mg/kg dw	11/05/1998	52	out	246	490	SW 8015M
N-octacosane (TPH surr)	104.0		%	11/05/1998		out	246	490	SW 8015M
UST VOLATILES NON-AQUEOUS									
Benzene	<0.005		mg/kg dw	11/07/1998	0.005	mjo		79	SW 8260A
Ethylbenzene	<0.005		mg/kg dw	11/07/1998	0.005	mjo		79	SW 8260A
Toluene	<0.005		mg/kg dw	11/07/1998	0.005	mjo		79	SW 8260A
Xylenes, Total	<0.005		mg/kg dw	11/07/1998	0.005	mjo		79	SW 8260A
Dibromofluoromethane (Surr)	98.0		%	11/07/1998	81-129	mjo		79	SW 8260A
Toluene-d8 (Surr)	80.0		%	11/07/1998	74-129	mjo		79	SW 8260A
4-Bromofluoromethane (Surr)	91.0		%	11/07/1998	70-130	mjo		79	SW 8260A
Prep, 8310 PNAs NON-AQUEOUS	extracted			11/05/1998		mmv	769		SW 3540C

PT : Pattern does not match the calibration standard; however, hydrocarbons are present in the diesel range.

MWG13-15_46018

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ANALYTICAL REPORT

Mr. Wei-Lin Feng
ENSR
740 Pasquinelli Drive
Westmont, IL 60559

11/11/1998

Sample No. : 500678

NET Job No.: 98.14072

Sample Description: S-6
ComEd-Waukegan; 1801-023-210

Date Taken: 10/29/1998
Time Taken: 14:50
IEPA Cert. No. 100221

Date Received: 10/30/1998
Time Received: 12:45
WDNR Cert. No. 999447130

Parameter	Results	Units	Date of Analysis	Method PQL	Analyst	Batch No. Prep/Run		Analytical Method
PNA CMPDS - 8310 NONAQUEOUS	ELV							
Acenaphthene	<2.1	mg/kg dw	11/10/1998	0.021	keh	769	1834	SW 8310
Acenaphthylene	<2.1	mg/kg dw	11/10/1998	0.021	keh	769	1834	SW 8310
Anthracene	<4.2	mg/kg dw	11/10/1998	0.042	keh	769	1834	SW 8310
Benzo(a)anthracene	<1.4	mg/kg dw	11/10/1998	0.0027	keh	769	1834	SW 8310
Benzo(b)fluoranthene	<0.38	mg/kg dw	11/10/1998	0.0038	keh	769	1834	SW 8310
Benzo(k)fluoranthene	<0.36	mg/kg dw	11/10/1998	0.0036	keh	769	1834	SW 8310
Benzo(a)pyrene	<0.48	mg/kg dw	11/10/1998	0.0048	keh	769	1834	SW 8310
Benzo(ghi)perylene	<4.2	mg/kg dw	11/10/1998	0.042	keh	769	1834	SW 8310
Chrysene	<3	mg/kg dw	11/10/1998	0.03	keh	769	1834	SW 8310
Dibenzo(a,h)anthracene	<0.6	mg/kg dw	11/10/1998	0.006	keh	769	1834	SW 8310
Fluoranthene	<2.1	mg/kg dw	11/10/1998	0.021	keh	769	1834	SW 8310
Fluorene	<2.1	mg/kg dw	11/10/1998	0.021	keh	769	1834	SW 8310
Indeno(1,2,3-cd)pyrene	<0.90	mg/kg dw	11/10/1998	0.0090	keh	769	1834	SW 8310
Naphthalene	<2.6	mg/kg dw	11/10/1998	0.026	keh	769	1834	SW 8310
Phenanthrene	<4.2	mg/kg dw	11/10/1998	0.042	keh	769	1834	SW 8310
Pyrene	<7.0	mg/kg dw	11/10/1998	0.021	keh	769	1834	SW 8310
Surr: p-Terphenyl	Diluted out		11/10/1998	43-125	keh	769	1834	SW 8310
PCB Non-Aqueous Extraction	COMPLETE		11/05/1998	COMPLETE	mmv	382		SW 3540C
PCB'S NON-AQUEOUS	ELV							
PCB-1016	<0.2	mg/kg dw	11/09/1998	0.042	tls	382	61	SW 8082
PCB-1221	<0.2	mg/kg dw	11/09/1998	0.042	tls	382	61	SW 8082
PCB-1232	<0.2	mg/kg dw	11/09/1998	0.042	tls	382	61	SW 8082
PCB-1242	<0.2	mg/kg dw	11/09/1998	0.042	tls	382	61	SW 8082
PCB-1248	<0.2	mg/kg dw	11/09/1998	0.042	tls	382	61	SW 8082
PCB-1254	<0.2	mg/kg dw	11/09/1998	0.042	tls	382	61	SW 8082

ELV : Elevated reporting limits due to matrix interference.

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ANALYTICAL REPORT

Mr. Wei-Lin Feng
ENSR
740 Pasquinelli Drive
Westmont, IL 60559

11/11/1998

Sample No. : 500678

NET Job No.: 98.14072

Sample Description: S-6
ComEd-Waukegan; 1801-023-210

Date Taken: 10/29/1998
Time Taken: 14:50
IEPA Cert. No. 100221

Date Received: 10/30/1998
Time Received: 12:45
WDNR Cert. No. 999447130

Parameter	Results	Units	Date of Analysis	Method PQL	Analyst	Batch No. Prep/Run		Analytical Method
PCB-1260	<0.2	mg/kg dw	11/09/1998	0.042	tls	382	61	SW 8082
Decachlorobiphenyl (Surr)	69.0	%	11/09/1998	NA	tls	382	61	SW 8082
2,4,5,6-TCMX (Surr)	52.0	%	11/09/1998	NA	tls	382	61	SW 8082

MWG13-15_46020

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ANALYTICAL REPORT

Mr. Wei-Lin Feng
ENSR
740 Pasquinelli Drive
Westmont, IL 60559

11/11/1998

Sample No. : 500679

NET Job No.: 98.14072

Sample Description: X-3
ComEd-Waukegan; 1801-023-210

Date Taken: 10/29/1998
Time Taken: 14:25
IEPA Cert. No. 100221

Date Received: 10/30/1998
Time Received: 12:45
WDNR Cert. No. 999447130

Parameter	Results		Units	Date of Analysis	Method PQL	Analyst	Batch No. Prep/Run		Analytical Method
pH, Non-Aqueous	7.99		units	11/06/1998	0.10	nwg		197	SW 9045B
Solids, Total	39.2		%	11/04/1998	0.1	aks		2528	SM 2540
Arsenic, GFAA	9.7		mg/kg dw	11/09/1998	1.3	mhp	239	675	SW 7060
Barium, ICP	765		mg/kg dw	11/10/1998	2.6	kdw	1173	2194	SW 6010B
Cadmium, ICP	2.2		mg/kg dw	11/09/1998	1.3	kdw	1173	2178	SW 6010B
Chromium, ICP	31		mg/kg dw	11/09/1998	5.1	kdw	1173	2163	SW 6010B
Lead, ICP	71		mg/kg dw	11/09/1998	10	kdw	1173	2401	SW 6010B
Mercury, CVAA	0.92		mg/kg dw	11/10/1998	0.10	sep	668	772	SW 7471A
Selenium, GFAA	0.71		mg/kg dw	11/09/1998	0.64	mhp	239	563	SW 7740
Silver, AA	<5.1		mg/kg dw	11/06/1998	5.1	sep	496	572	SW 7760
Prep, TPH 8015M - NONAQUEOUS	extracted			11/03/1998		mmv	246		SW 8015M
TPH MODIFIED 8015									
TPH as Gas	<130		mg/kg dw	11/05/1998	130	out	246	490	SW 8015M
TPH as Diesel	<130		mg/kg dw	11/05/1998	130	out	246	490	SW 8015M
TPH as Oil	9,390	PT	mg/kg dw	11/05/1998	130	out	246	490	SW 8015M
N-octacosane (TPH surr)	46.0		%	11/05/1998		out	246	490	SW 8015M
UST VOLATILES NON-AQUEOUS									
Benzene	<0.01		mg/kg dw	11/07/1998	0.01	mjo		79	SW 8260A
Ethylbenzene	<0.01		mg/kg dw	11/07/1998	0.01	mjo		79	SW 8260A
Toluene	<0.01		mg/kg dw	11/07/1998	0.01	mjo		79	SW 8260A
Xylenes, Total	<0.01		mg/kg dw	11/07/1998	0.01	mjo		79	SW 8260A
Dibromofluoromethane (Surr)	82.2		%	11/07/1998	81-129	mjo		79	SW 8260A
Toluene-d8 (Surr)	86.4		%	11/07/1998	74-129	mjo		79	SW 8260A
4-Bromofluoromethane (Surr)	92.8		%	11/07/1998	70-130	mjo		79	SW 8260A
Prep, 8310 PNAs NON-AQUEOUS	extracted			11/05/1998		mmv	769		SW 3540C

PT : Pattern does not match the calibration standard; however, hydrocarbons are present in the oil range.

MWG13-15_46021

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ANALYTICAL REPORT

Mr. Wei-Lin Feng
ENSR
740 Pasquinelli Drive
Westmont, IL 60559

11/11/1998

Sample No. : 500679

NET Job No.: 98.14072

Sample Description: X-3
ComEd-Waukegan; 1801-023-210

Date Taken: 10/29/1998
Time Taken: 14:25
IEPA Cert. No. 100221

Date Received: 10/30/1998
Time Received: 12:45
WDNR Cert. No. 999447130

Parameter	Results		Units	Date of Analysis	Method PQL	Analyst	Batch No. Prep/Run		Analytical Method
PNA CMPDS - 8310 NONAQUEOUS									
Acenaphthene	<0.12	MX	mg/kg dw	11/10/1998	0.051	keh	769	1834	SW 8310
Acenaphthylene	<0.051		mg/kg dw	11/10/1998	0.051	keh	769	1834	SW 8310
Anthracene	<0.10		mg/kg dw	11/10/1998	0.10	keh	769	1834	SW 8310
Benzo(a)anthracene	<0.74	MX	mg/kg dw	11/10/1998	0.0066	keh	769	1834	SW 8310
Benzo(b)fluoranthene	0.092		mg/kg dw	11/10/1998	0.0092	keh	769	1834	SW 8310
Benzo(k)fluoranthene	<0.20	MX	mg/kg dw	11/10/1998	0.0087	keh	769	1834	SW 8310
Benzo(a)pyrene	<0.13	MX	mg/kg dw	11/10/1998	0.012	keh	769	1834	SW 8310
Benzo(ghi)perylene	<0.10		mg/kg dw	11/10/1998	0.10	keh	769	1834	SW 8310
Chrysene	0.17		mg/kg dw	11/10/1998	0.08	keh	769	1834	SW 8310
Dibenzo(a,h)anthracene	<0.031	MX	mg/kg dw	11/10/1998	0.02	keh	769	1834	SW 8310
Fluoranthene	0.33		mg/kg dw	11/10/1998	0.051	keh	769	1834	SW 8310
Fluorene	<0.79	MX	mg/kg dw	11/10/1998	0.051	keh	769	1834	SW 8310
Indeno(1,2,3-cd)pyrene	0.061		mg/kg dw	11/10/1998	0.022	keh	769	1834	SW 8310
Naphthalene	<0.064		mg/kg dw	11/10/1998	0.064	keh	769	1834	SW 8310
Phenanthrene	0.23		mg/kg dw	11/10/1998	0.10	keh	769	1834	SW 8310
Pyrene	0.28		mg/kg dw	11/10/1998	0.051	keh	769	1834	SW 8310
Surr: p-Terphenyl	Masked			11/10/1998	43-125	keh	769	1834	SW 8310
PCB Non-Aqueous Extraction	COMPLETE			11/05/1998	COMPLETE	mmv	382		SW 3540C
PCB'S NON-AQUEOUS									
PCB-1016	<0.10		mg/kg dw	11/07/1998	0.10	tls	382	58	SW 8082
PCB-1221	<0.10		mg/kg dw	11/07/1998	0.10	tls	382	58	SW 8082
PCB-1232	<0.10		mg/kg dw	11/07/1998	0.10	tls	382	58	SW 8082
PCB-1242	<0.10		mg/kg dw	11/07/1998	0.10	tls	382	58	SW 8082
PCB-1248	<0.10		mg/kg dw	11/07/1998	0.10	tls	382	58	SW 8082
PCB-1254	<0.10		mg/kg dw	11/07/1998	0.10	tls	382	58	SW 8082

MX : Dilution required due to sample matrix; analyte is not detected.

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ANALYTICAL REPORT

Mr. Wei-Lin Feng
ENSR
740 Pasquinelli Drive
Westmont, IL 60559

11/11/1998

Sample No. : 500679

NET Job No.: 98.14072

Sample Description: X-3
ComEd-Waukegan; 1801-023-210

Date Taken: 10/29/1998
Time Taken: 14:25
IEPA Cert. No. 100221

Date Received: 10/30/1998
Time Received: 12:45
WDNR Cert. No. 999447130

Parameter	Results	Units	Date of Analysis	Method PQL	Analyst	Batch No. Prep/Run	Analytical Method
PCB-1260	<0.10	mg/kg dw	11/07/1998	0.10	tls	382 58	SW 8082
Decachlorobiphenyl (Surr)	70.0	%	11/07/1998	NA	tls	382 58	SW 8082
2,4,5,6-TCMX (Surr)	112.0	%	11/07/1998	NA	tls	382 58	SW 8082

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ANALYTICAL REPORT

Mr. Wei-Lin Feng
ENSR
740 Pasquinelli Drive
Westmont, IL 60559

11/11/1998

Sample No. : 500680

NET Job No.: 98.14072

Sample Description: X-5
ComEd-Waukegan; 1801-023-210

Date Taken: 10/29/1998
Time Taken: 15:40
IEPA Cert. No. 100221

Date Received: 10/30/1998
Time Received: 12:45
WDNR Cert. No. 999447130

Parameter	Results		Units	Date of Analysis	Method PQL	Analyst	Batch No. Prep/Run		Analytical Method
pH, Non-Aqueous	8.92		units	11/06/1998	0.10	nwg		197	SW 9045B
Solids, Total	53.0		%	11/04/1998	0.1	aks		2528	SM 2540
Arsenic, GFAA	28		mg/kg dw	11/09/1998	0.94	mhp	239	675	SW 7060
Barium, ICP	3,770		mg/kg dw	11/10/1998	1.9	kdw	1173	2194	SW 6010B
Cadmium, ICP	2.1		mg/kg dw	11/09/1998	0.94	kdw	1173	2178	SW 6010B
Chromium, ICP	42		mg/kg dw	11/09/1998	3.8	kdw	1173	2163	SW 6010B
Lead, ICP	55		mg/kg dw	11/09/1998	7.5	kdw	1173	2401	SW 6010B
Mercury, CVAA	0.77		mg/kg dw	11/10/1998	0.075	sep	668	772	SW 7471A
Selenium, GFAA	2.6		mg/kg dw	11/09/1998	0.47	mhp	239	563	SW 7740
Silver, AA	4.5		mg/kg dw	11/06/1998	3.8	sep	496	572	SW 7760
Prep, TPH 8015M - NONAQUEOUS	extracted			11/03/1998		mmv	246		SW 8015M
TPH MODIFIED 8015									
TPH as Gas	<94		mg/kg dw	11/05/1998	94	out	246	490	SW 8015M
TPH as Diesel	<94		mg/kg dw	11/05/1998	94	out	246	490	SW 8015M
TPH as Oil	<94		mg/kg dw	11/05/1998	94	out	246	490	SW 8015M
N-octacosane (TPH surr)	75.0		%	11/05/1998		out	246	490	SW 8015M
UST VOLATILES NON-AQUEOUS									
Benzene	<0.009		mg/kg dw	11/07/1998	0.009	mjo		79	SW 8260A
Ethylbenzene	<0.009		mg/kg dw	11/07/1998	0.009	mjo		79	SW 8260A
Toluene	<0.009		mg/kg dw	11/07/1998	0.009	mjo		79	SW 8260A
Xylenes, Total	<0.009		mg/kg dw	11/07/1998	0.009	mjo		79	SW 8260A
Dibromofluoromethane (Surr)	128.8	R	%	11/07/1998	81-129	mjo		79	SW 8260A
Toluene-d8 (Surr)	81.6		%	11/07/1998	74-129	mjo		79	SW 8260A
4-Bromofluoromethane (Surr)	60.2	R	%	11/07/1998	70-130	mjo		79	SW 8260A
Prep, 8310 PNAs NON-AQUEOUS	extracted			11/05/1998		mmv	769		SW 3540C

R : Surrogate recovery verified by re-analysis.

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ANALYTICAL REPORT

Mr. Wei-Lin Feng
ENSR
740 Pasquinelli Drive
Westmont, IL 60559

11/11/1998

Sample No. : 500680

NET Job No.: 98.14072

Sample Description: X-5
ComEd-Waukegan; 1801-023-210

Date Taken: 10/29/1998
Time Taken: 15:40
IEPA Cert. No. 100221

Date Received: 10/30/1998
Time Received: 12:45
WDNR Cert. No. 999447130

Parameter	Results		Units	Date of Analysis	Method PQL	Analyst	Batch No. Prep/Run		Analytical Method
PNA CMPDS - 8310 NONAQUEOUS									
Acenaphthene	<0.038		mg/kg dw	11/10/1998	0.038	keh	769	1834	SW 8310
Acenaphthylene	<0.038		mg/kg dw	11/10/1998	0.038	keh	769	1834	SW 8310
Anthracene	<0.075		mg/kg dw	11/10/1998	0.075	keh	769	1834	SW 8310
Benzo(a)anthracene	<0.043	MX	mg/kg dw	11/10/1998	0.0049	keh	769	1834	SW 8310
Benzo(b)fluoranthene	<0.0068		mg/kg dw	11/10/1998	0.0068	keh	769	1834	SW 8310
Benzo(k)fluoranthene	<0.032	MX	mg/kg dw	11/10/1998	0.0064	keh	769	1834	SW 8310
Benzo(a)pyrene	<0.0087		mg/kg dw	11/10/1998	0.0087	keh	769	1834	SW 8310
Benzo(ghi)perylene	<0.075		mg/kg dw	11/10/1998	0.075	keh	769	1834	SW 8310
Chrysene	<0.06		mg/kg dw	11/10/1998	0.06	keh	769	1834	SW 8310
Dibenzo(a,h)anthracene	<0.01		mg/kg dw	11/10/1998	0.01	keh	769	1834	SW 8310
Fluoranthene	<0.038		mg/kg dw	11/10/1998	0.038	keh	769	1834	SW 8310
Fluorene	<0.038		mg/kg dw	11/10/1998	0.038	keh	769	1834	SW 8310
Indeno(1,2,3-cd)pyrene	<0.016		mg/kg dw	11/10/1998	0.016	keh	769	1834	SW 8310
Naphthalene	<0.047		mg/kg dw	11/10/1998	0.047	keh	769	1834	SW 8310
Phenanthrene	<0.075		mg/kg dw	11/10/1998	0.075	keh	769	1834	SW 8310
Pyrene	<0.038		mg/kg dw	11/10/1998	0.038	keh	769	1834	SW 8310
Surr: p-Terphenyl	21.0	SR	%	11/10/1998	43-125	keh	769	1834	SW 8310
PCB Non-Aqueous Extraction	COMPLETE			11/05/1998	COMPLETE	mmv	382		SW 3540C
PCB'S NON-AQUEOUS									
PCB-1016	<0.075		mg/kg dw	11/07/1998	0.075	tls	382	58	SW 8082
PCB-1221	<0.075		mg/kg dw	11/07/1998	0.075	tls	382	58	SW 8082
PCB-1232	<0.075		mg/kg dw	11/07/1998	0.075	tls	382	58	SW 8082
PCB-1242	<0.075		mg/kg dw	11/07/1998	0.075	tls	382	58	SW 8082
PCB-1248	<0.075		mg/kg dw	11/07/1998	0.075	tls	382	58	SW 8082
PCB-1254	<0.075		mg/kg dw	11/07/1998	0.075	tls	382	58	SW 8082

MX : Dilution required due to sample matrix; analyte is not detected.
SR : Surrogate recovery was outside of acceptance limits, due to sample matrix

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ANALYTICAL REPORT

Mr. Wei-Lin Feng
ENSR
740 Pasquinelli Drive
Westmont, IL 60559

11/11/1998

Sample No. : 500680

NET Job No.: 98.14072

Sample Description: X-5
ComEd-Waukegan; 1801-023-210

Date Taken: 10/29/1998
Time Taken: 15:40
IEPA Cert. No. 100221

Date Received: 10/30/1998
Time Received: 12:45
WDNR Cert. No. 999447130

Parameter	Results	Units	Date of Analysis	Method PQL	Analyst	Batch No. Prep/Run		Analytical Method
PCB-1260	<0.075	mg/kg dw	11/07/1998	0.075	tls	382	58	SW 8082
Decachlorobiphenyl (Surr)	77.0	%	11/07/1998	NA	tls	382	58	SW 8082
2,4,5,6-TCMX (Surr)	73.0	%	11/07/1998	NA	tls	382	58	SW 8082

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ANALYTICAL REPORT

Mr. Wei-Lin Feng
ENSR
740 Pasquinelli Drive
Westmont, IL 60559

11/11/1998

Sample No. : 500681

NET Job No.: 98.14072

Sample Description: X-6
ComEd-Waukegan; 1801-023-210

Date Taken: 10/29/1998
Time Taken: 15:50
IEPA Cert. No. 100221

Date Received: 10/30/1998
Time Received: 12:45
WDNR Cert. No. 999447130

Parameter	Results		Units	Date of Analysis	Method PQL	Analyst	Batch No. Prep/Run		Analytical Method
pH, Non-Aqueous	8.89		units	11/06/1998	0.10	nwg		198	SW 9045B
Solids, Total	47.9		%	11/04/1998	0.1	aks		2529	SM 2540
Arsenic, GFAA	33		mg/kg dw	11/09/1998	1.0	mhp	239	675	SW 7060
Barium, ICP	3,970		mg/kg dw	11/10/1998	2.1	kdw	1173	2194	SW 6010B
Cadmium, ICP	2.9		mg/kg dw	11/09/1998	1.0	kdw	1173	2178	SW 6010B
Chromium, ICP	52		mg/kg dw	11/09/1998	4.2	kdw	1173	2163	SW 6010B
Lead, ICP	71		mg/kg dw	11/09/1998	8.4	kdw	1173	2401	SW 6010B
Mercury, CVAA	0.73		mg/kg dw	11/10/1998	0.084	sep	668	772	SW 7471A
Selenium, GFAA	2.5	M+	mg/kg dw	11/09/1998	0.52	mhp	239	563	SW 7740
Silver, AA	<4.2		mg/kg dw	11/06/1998	4.2	sep	496	572	SW 7760
Prep, TPH 8015M - NONAQUEOUS	extracted			11/03/1998		mmv	246		SW 8015M
TPH MODIFIED 8015									
TPH as Gas	<100		mg/kg dw	11/05/1998	100	out	246	490	SW 8015M
TPH as Diesel	<100		mg/kg dw	11/05/1998	100	out	246	490	SW 8015M
TPH as Oil	223	PT	mg/kg dw	11/05/1998	100	out	246	490	SW 8015M
N-octacosane (TPH surr)	78.0		%	11/05/1998		out	246	490	SW 8015M
UST VOLATILES NON-AQUEOUS									
Benzene	<0.01		mg/kg dw	11/07/1998	0.01	mjo		79	SW 8260A
Ethylbenzene	<0.01		mg/kg dw	11/07/1998	0.01	mjo		79	SW 8260A
Toluene	<0.01		mg/kg dw	11/07/1998	0.01	mjo		79	SW 8260A
Xylenes, Total	<0.01		mg/kg dw	11/07/1998	0.01	mjo		79	SW 8260A
Dibromofluoromethane (Surr)	101.0		%	11/07/1998	81-129	mjo		79	SW 8260A
Toluene-d8 (Surr)	80.6		%	11/07/1998	74-129	mjo		79	SW 8260A
4-Bromofluoromethane (Surr)	54.8	R	%	11/07/1998	70-130	mjo		79	SW 8260A
Prep, 8310 PNAs NON-AQUEOUS	extracted			11/05/1998		mmv	769		SW 3540C

PT : Pattern does not match the calibration standard; however, hydrocarbons are present in the oil range.
R : Surrogate recovery verified by re-analysis.

MWG13-15_46027

NATIONAL ENVIRONMENTAL TESTING, INC.

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ANALYTICAL REPORT

Mr. Wei-Lin Feng
ENSR
740 Pasquinelli Drive
Westmont, IL 60559

11/11/1998

Sample No. : 500681

NET Job No.: 98.14072

Sample Description: X-6
ComEd-Waukegan; 1801-023-210

Date Taken: 10/29/1998
Time Taken: 15:50
IEPA Cert. No. 100221

Date Received: 10/30/1998
Time Received: 12:45
WDNR Cert. No. 999447130

Parameter	Results		Units	Date of Analysis	Method PQL	Analyst	Batch No. Prep/Run		Analytical Method
PNA CMPDS - 8310 NONAQUEOUS									
Acenaphthene	<0.042		mg/kg dw	11/10/1998	0.042	keh	769	1834	SW 8310
Acenaphthylene	<0.042		mg/kg dw	11/10/1998	0.042	keh	769	1834	SW 8310
Anthracene	<0.084		mg/kg dw	11/10/1998	0.084	keh	769	1834	SW 8310
Benzo(a)anthracene	<0.10	MX	mg/kg dw	11/10/1998	0.0054	keh	769	1834	SW 8310
Benzo(b)fluoranthene	<0.0075		mg/kg dw	11/10/1998	0.0075	keh	769	1834	SW 8310
Benzo(k)fluoranthene	<0.0071		mg/kg dw	11/10/1998	0.0071	keh	769	1834	SW 8310
Benzo(a)pyrene	<0.0096		mg/kg dw	11/10/1998	0.0096	keh	769	1834	SW 8310
Benzo(ghi)perylene	<0.084		mg/kg dw	11/10/1998	0.084	keh	769	1834	SW 8310
Chrysene	<0.06		mg/kg dw	11/10/1998	0.06	keh	769	1834	SW 8310
Dibenzo(a,h)anthracene	<0.01		mg/kg dw	11/10/1998	0.01	keh	769	1834	SW 8310
Fluoranthene	<0.042		mg/kg dw	11/10/1998	0.042	keh	769	1834	SW 8310
Fluorene	<0.042		mg/kg dw	11/10/1998	0.042	keh	769	1834	SW 8310
Indeno(1,2,3-cd)pyrene	<0.018		mg/kg dw	11/10/1998	0.018	keh	769	1834	SW 8310
Naphthalene	<0.052		mg/kg dw	11/10/1998	0.052	keh	769	1834	SW 8310
Phenanthrene	<0.084		mg/kg dw	11/10/1998	0.084	keh	769	1834	SW 8310
Pyrene	<0.042		mg/kg dw	11/10/1998	0.042	keh	769	1834	SW 8310
Surr: p-Terphenyl	83.8		%	11/10/1998	43-125	keh	769	1834	SW 8310
PCB Non-Aqueous Extraction	COMPLETE			11/05/1998	COMPLETE	mmv	382		SW 3540C
PCB'S NON-AQUEOUS									
PCB-1016	<0.084		mg/kg dw	11/07/1998	0.084	tls	382	58	SW 8082
PCB-1221	<0.084		mg/kg dw	11/07/1998	0.084	tls	382	58	SW 8082
PCB-1232	<0.084		mg/kg dw	11/07/1998	0.084	tls	382	58	SW 8082
PCB-1242	<0.084		mg/kg dw	11/07/1998	0.084	tls	382	58	SW 8082
PCB-1248	<0.084		mg/kg dw	11/07/1998	0.084	tls	382	58	SW 8082
PCB-1254	<0.084		mg/kg dw	11/07/1998	0.084	tls	382	58	SW 8082

MX : Dilution required due to sample matrix; analyte is not detected.

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ANALYTICAL REPORT

Mr. Wei-Lin Feng
ENSR
740 Pasquinelli Drive
Westmont, IL 60559

11/11/1998

Sample No. : 500681

NET Job No.: 98.14072

Sample Description: X-6
ComEd-Waukegan; 1801-023-210

Date Taken: 10/29/1998
Time Taken: 15:50
IEPA Cert. No. 100221

Date Received: 10/30/1998
Time Received: 12:45
WDNR Cert. No. 999447130

Parameter	Results	Units	Date of Analysis	Method PQL	Analyst	Batch No. Prep/Run	Analytical Method
PCB-1260	<0.084	mg/kg dw	11/07/1998	0.084	tls	382 58	SW 8082
Decachlorobiphenyl (Surr)	74.0	%	11/07/1998	NA	tls	382 58	SW 8082
2,4,5,6-TCMX (Surr)	86.0	%	11/07/1998	NA	tls	382 58	SW 8082

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QUALITY CONTROL REPORT

CONTINUING CALIBRATION VERIFICATION

ENSR
740 Pasquinelli Drive
Westmont, IL 60559

11/11/1998

NET Job Number: 98.14072

Mr. Wei-Lin Feng

Analyte	Run Batch Number	CCV True Conc.	Conc. Found	Percent Recovery
pH, Non-Aqueous	196	7.00	7.00	100.0
pH, Non-Aqueous	197	7.00	7.00	100.0
pH, Non-Aqueous	198	7.00	7.0	100.0
Arsenic, GFAA	674	0.0250	0.0248	99.2
Arsenic, GFAA	675	0.0250	0.0243	97.2
Barium, ICP	2188	2.00	1.99	99.5
Barium, ICP	2188	2.00	2.03	101.5
Barium, ICP	2194	2.00	2.07	103.5
Cadmium, ICP	2174	1.00	1.07	107.0
Cadmium, ICP	2178	1.00	0.996	99.6
Chromium, ICP	2159	2.00	2.17	108.5
Chromium, ICP	2163	2.00	2.00	100.0
Lead, ICP	2397	2.00	2.11	105.5
Lead, ICP	2401	2.00	2.02	101.0
Mercury, CVAA	770	0.0025	0.00230	92.0
Mercury, CVAA	772	0.0025	0.00253	101.2
Selenium, GFAA	562	0.050	0.0506	101.2
Selenium, GFAA	562	0.050	0.0501	100.2
Selenium, GFAA	563	0.0500	0.0494	98.8
Silver, AA	571	0.50	0.497	99.4
Silver, AA	572	0.50	0.495	99.0
UST VOLATILES NON-AQUEOUS				
Benzene	77	50.0	53.6	107.2
Ethylbenzene	77	50.0	53.3	106.6
Toluene	77	50.0	55.2	110.4
Xylenes, Total	77	150	161	107.3
UST VOLATILES NON-AQUEOUS				
Benzene	78	50.0	54.7	109.4
Ethylbenzene	78	50.0	53.1	106.2
Toluene	78	50.0	54.9	109.8
Xylenes, Total	78	150	160	106.7
UST VOLATILES NON-AQUEOUS				
Benzene	79	50.0	48.6	97.2
Ethylbenzene	79	50.0	46.5	93.0

CCV - Continuing Calibration Verification

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QUALITY CONTROL REPORT

CONTINUING CALIBRATION VERIFICATION

ENSR
740 Pasquinelli Drive
Westmont, IL 60559

Mr. Wei-Lin Feng

11/11/1998

NET Job Number: 98.14072

Analyte	Run Batch Number	CCV True Conc.	Conc. Found	Percent Recovery
Toluene	79	50.0	49.6	99.2
Xylenes, Total	79	150	140	93.3
UST VOLATILES NON-AQUEOUS				
Benzene	80	50.0	47.8	95.6
Ethylbenzene	80	50.0	45.3	90.6
Toluene	80	50.0	47.7	95.4
Xylenes, Total	80	150	138	92.0
PNA CMPDS - 8310 NONAQUEOUS				
Acenaphthene	1833	5000	4,772	95.4
Acenaphthylene	1833	5000	5,052	101.0
Anthracene	1833	5000	5,101	102.0
Benzo(a)anthracene	1833	5000	5,100	102.0
Benzo(b)fluoranthene	1833	5000	5,023	100.5
Benzo(k)fluoranthene	1833	5000	4,833	96.7
Benzo(a)pyrene	1833	5000	4,841	96.8
Benzo(ghi)perylene	1833	5000	5,077	101.5
Chrysene	1833	5000	5,078	101.6
Dibenzo(a,h)anthracene	1833	5000	4,997	99.9
Fluoranthene	1833	5000	5,044	100.9
Fluorene	1833	5000	4,953	99.1
Indeno(1,2,3-cd)pyrene	1833	5000	5,032	100.6
Naphthalene	1833	5000	4,652	93.0
Phenanthrene	1833	5000	5,042	100.8
Pyrene	1833	5000	4,907	98.1
Surr: p-Terphenyl	1833	5000	4,856	97.1
PNA CMPDS - 8310 NONAQUEOUS				
Acenaphthene	1833	5000	4,848	97.0
Acenaphthylene	1833	5000	5,219	104.4
Anthracene	1833	5000	5,161	103.2
Benzo(a)anthracene	1833	5000	5,266	105.3
Benzo(b)fluoranthene	1833	5000	4,961	99.2
Benzo(k)fluoranthene	1833	5000	4,980	99.6
Benzo(a)pyrene	1833	5000	4,874	97.5
Benzo(ghi)perylene	1833	5000	5,175	103.5

CCV - Continuing Calibration Verification

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QUALITY CONTROL REPORT

CONTINUING CALIBRATION VERIFICATION

ENSR
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11/11/1998

NET Job Number: 98.14072

Mr. Wei-Lin Feng

Analyte	Run Batch Number	CCV True Conc.	Conc. Found	Percent Recovery
Chrysene	1833	5000	5,175	103.5
Dibenzo(a,h)anthracene	1833	5000	5,114	102.3
Fluoranthene	1833	5000	5,133	102.7
Fluorene	1833	5000	5,041	100.8
Indeno(1,2,3-cd)pyrene	1833	5000	5,070	101.4
Naphthalene	1833	5000	4,767	95.3
Phenanthrene	1833	5000	5,120	102.4
Pyrene	1833	5000	4,980	99.6
Surr: p-Terphenyl	1833	5000	4,976	99.5
PNA CMPDS - 8310 NONAQUEOUS				
Acenaphthene	1833	5000	4,815	96.3
Acenaphthylene	1833	5000	5,143	102.9
Anthracene	1833	5000	5,176	103.5
Benzo(a)anthracene	1833	5000	5,204	104.1
Benzo(b)fluoranthene	1833	5000	5,071	101.4
Benzo(k)fluoranthene	1833	5000	4,923	98.5
Benzo(a)pyrene	1833	5000	4,957	99.1
Benzo(ghi)perylene	1833	5000	5,149	103.0
Chrysene	1833	5000	5,232	104.6
Dibenzo(a,h)anthracene	1833	5000	5,058	101.2
Fluoranthene	1833	5000	5,090	101.8
Fluorene	1833	5000	5,015	100.3
Indeno(1,2,3-cd)pyrene	1833	5000	5,098	102.0
Naphthalene	1833	5000	4,759	95.2
Phenanthrene	1833	5000	5,135	102.7
Pyrene	1833	5000	5,004	100.1
Surr: p-Terphenyl	1833	5000	5,030	100.6
PNA CMPDS - 8310 NONAQUEOUS				
Acenaphthene	1833	5000	4,926	98.5
Acenaphthylene	1833	5000	5,116	102.3
Anthracene	1833	5000	5,182	103.6
Benzo(a)anthracene	1833	5000	5,207	104.1
Benzo(b)fluoranthene	1833	5000	4,911	98.2
Benzo(k)fluoranthene	1833	5000	4,858	97.2

CCV - Continuing Calibration Verification

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QUALITY CONTROL REPORT

CONTINUING CALIBRATION VERIFICATION

ENSR
740 Pasquinelli Drive
Westmont, IL 60559

11/11/1998

NET Job Number: 98.14072

Mr. Wei-Lin Feng

Analyte	Run Batch Number	CCV True Conc.	Conc. Found	Percent Recovery
Benzo(a)pyrene	1833	5000	4,927	98.5
Benzo(ghi)perylene	1833	5000	5,045	100.9
Chrysene	1833	5000	5,186	103.7
Dibenzo(a,h)anthracene	1833	5000	5,114	102.3
Fluoranthene	1833	5000	5,120	102.4
Fluorene	1833	5000	5,038	100.8
Indeno(1,2,3-cd)pyrene	1833	5000	5,132	102.6
Naphthalene	1833	5000	4,745	94.9
Phenanthrene	1833	5000	5,144	102.9
Pyrene	1833	5000	5,045	100.9
Surr: p-Terphenyl	1833	5000	4,911	98.2
PNA CMPDS - 8310 NONAQUEOUS				
Acenaphthene	1834	5000	4,550	91.0
Acenaphthylene	1834	5000	5,058	101.2
Anthracene	1834	5000	5,063	101.3
Benzo(a)anthracene	1834	5000	4,980	99.6
Benzo(b)fluoranthene	1834	5000	4,930	98.6
Benzo(k)fluoranthene	1834	5000	4,872	97.4
Benzo(a)pyrene	1834	5000	4,826	96.5
Benzo(ghi)perylene	1834	5000	4,855	97.1
Chrysene	1834	5000	4,996	99.9
Dibenzo(a,h)anthracene	1834	5000	4,914	98.3
Fluoranthene	1834	5000	4,867	97.3
Fluorene	1834	5000	4,876	97.5
Indeno(1,2,3-cd)pyrene	1834	5000	4,600	92.0
Naphthalene	1834	5000	4,583	91.7
Phenanthrene	1834	5000	4,614	92.3
Pyrene	1834	5000	4,947	98.9
Surr: p-Terphenyl	1834	5000	4,831	96.6
PNA CMPDS - 8310 NONAQUEOUS				
Acenaphthene	1834	5000	4,611	92.2
Acenaphthylene	1834	5000	5,039	100.8
Anthracene	1834	5000	5,085	101.7
Benzo(a)anthracene	1834	5000	4,971	99.4

CCV - Continuing Calibration Verification

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QUALITY CONTROL REPORT

CONTINUING CALIBRATION VERIFICATION

ENSR
740 Pasquinelli Drive
Westmont, IL 60559

11/11/1998

NET Job Number: 98.14072

Mr. Wei-Lin Feng

Analyte	Run Batch Number	CCV True Conc.	Conc. Found	Percent Recovery
Benzo(b)fluoranthene	1834	5000	4,874	97.5
Benzo(k)fluoranthene	1834	5000	4,857	97.1
Benzo(a)pyrene	1834	5000	5,112	102.2
Benzo(ghi)perylene	1834	5000	4,926	98.5
Chrysene	1834	5000	5,072	101.4
Dibenzo(a,h)anthracene	1834	5000	4,944	98.9
Fluoranthene	1834	5000	4,890	97.8
Fluorene	1834	5000	4,895	97.9
Indeno(1,2,3-cd)pyrene	1834	5000	4,465	89.3
Naphthalene	1834	5000	4,705	94.1
Phenanthrene	1834	5000	4,608	92.2
Pyrene	1834	5000	4,986	99.7
Surr: p-Terphenyl	1834	5000	4,754	95.1
PNA CMPDS - 8310 NONAQUEOUS				
Acenaphthene	1834	5000	4,433	88.7
Acenaphthylene	1834	5000	5,054	101.1
Anthracene	1834	5000	5,185	103.7
Benzo(a)anthracene	1834	5000	4,988	99.8
Benzo(b)fluoranthene	1834	5000	4,898	98.0
Benzo(k)fluoranthene	1834	5000	4,927	98.5
Benzo(a)pyrene	1834	5000	5,071	101.4
Benzo(ghi)perylene	1834	5000	4,983	99.7
Chrysene	1834	5000	5,015	100.3
Dibenzo(a,h)anthracene	1834	5000	5,124	102.5
Fluoranthene	1834	5000	5,102	102.0
Fluorene	1834	5000	5,010	100.2
Indeno(1,2,3-cd)pyrene	1834	5000	4,507	90.1
Naphthalene	1834	5000	4,621	92.4
Phenanthrene	1834	5000	4,812	96.2
Pyrene	1834	5000	5,147	102.9
Surr: p-Terphenyl	1834	5000	4,778	95.6
PNA CMPDS - 8310 NONAQUEOUS				
Chrysene	1835	5000	4,966	99.3
PNA CMPDS - 8310 NONAQUEOUS				

CCV - Continuing Calibration Verification

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QUALITY CONTROL REPORT

CONTINUING CALIBRATION VERIFICATION

ENSR
740 Pasquinelli Drive
Westmont, IL 60559

11/11/1998

NET Job Number: 98.14072

Mr. Wei-Lin Feng

Analyte	Run Batch Number	CCV True Conc.	Conc. Found	Percent Recovery
Chrysene	1835	5000	5,018	100.4
PNA CMPDS - 8310 NONAQUEOUS				
Chrysene	1835	5000	4,928	98.6
PCB'S NON-AQUEOUS				
PCB-1016	58	500	494	98.8
PCB-1260	58	500	436	87.2
PCB'S NON-AQUEOUS				
PCB-1016	58	500	506	101.2
PCB-1260	58	500	444	88.8
PCB'S NON-AQUEOUS				
PCB-1016	58	500	505	101.0
PCB-1260	58	500	505	101.0
PCB'S NON-AQUEOUS				
PCB-1016	58	500	469	93.8
PCB-1260	58	500	451	90.2
PCB'S NON-AQUEOUS				
PCB-1016	58	500	498	99.6
PCB-1260	58	500	431	86.2
PCB'S NON-AQUEOUS				
PCB-1016	60	500	489	97.8
PCB-1260	60	500	490	98.0
PCB'S NON-AQUEOUS				
PCB-1016	60	500	500	100.0
PCB-1260	60	500	479	95.8
PCB'S NON-AQUEOUS				
PCB-1016	60	500	498	99.6
PCB-1016	60	500	498	99.6
PCB-1260	60	500	457	91.4
PCB-1260	60	500	457	91.4
PCB'S NON-AQUEOUS				
PCB-1016	61	500	483	96.6
PCB-1260	61	500	453	90.6
PCB'S NON-AQUEOUS				
PCB-1016	61	500	494	98.8

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QUALITY CONTROL REPORT

CONTINUING CALIBRATION VERIFICATION

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11/11/1998

NET Job Number: 98.14072

Mr. Wei-Lin Feng

Analyte	Run Batch Number	CCV True Conc.	Conc. Found	Percent Recovery
PCB-1260	61	500	454	90.8
PCB'S NON-AQUEOUS				
PCB-1016	61	500	510	102.0
PCB-1260	61	500	503	100.6

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QUALITY CONTROL REPORT

BLANK ANALYSIS

ENSR
740 Pasquinelli Drive
Westmont, IL 60559

11/11/1998

NET Job Number: 98.14072

Mr. Wei-Lin Feng

Analyte	Prep Batch Number	Run Batch Number	Blank Analysis Results	Units	Reporting Limit	Analytical Method
Arsenic, GFAA	236	674	<0.25	mg/Kg	0.50	SW 7060
Arsenic, GFAA	238	673	<0.50	mg/Kg	0.50	SW 7060
Arsenic, GFAA	239	675	<0.50	mg/Kg	0.50	SW 7060
Barium, ICP	1169	2188	<1.0	mg/Kg	1.0	SW 6010B
Barium, ICP	1172	2194	<1.0	mg/Kg	1.0	SW 6010B
Barium, ICP	1173	2194	<1.0	mg/Kg	1.0	SW 6010B
Cadmium, ICP	1169	2174	<0.50	mg/Kg	0.50	SW 6010B
Cadmium, ICP	1172	2178	<0.50	mg/Kg	0.50	SW 6010B
Cadmium, ICP	1173	2178	<0.50	mg/Kg	0.50	SW 6010B
Chromium, ICP	1169	2159	<2.0	mg/Kg	2.0	SW 6010B
Chromium, ICP	1172	2163	<2.0	mg/Kg	2.0	SW 6010B
Chromium, ICP	1173	2163	<2.0	mg/Kg	2.0	SW 6010B
Lead, ICP	1169	2397	<4.0	mg/Kg	4.0	SW 6010B
Lead, ICP	1172	2401	<4.0	mg/Kg	4.0	SW 6010B
Lead, ICP	1173	2401	<4.0	mg/Kg	4.0	SW 6010B
Mercury, CVAA	666	770	<0.040	mg/Kg	0.040	SW 7471A
Mercury, CVAA	668	772	<0.040	mg/Kg	0.040	SW 7471A
Selenium, GFAA	236	562	<0.25	mg/Kg	0.25	SW 7740
Selenium, GFAA	238	562	<0.25	mg/Kg	0.25	SW 7740
Selenium, GFAA	239	563	<0.25	mg/Kg	0.25	SW 7740
Silver, AA	494	571	<2.0	mg/Kg	2.0	SW 7760
Silver, AA	496	572	<2.0	mg/Kg	2.0	SW 7760
TPH MODIFIED 8015						SW 8015M
TPH as Gas	246	490	<50	mg/Kg	50	SW 8015M
TPH as Diesel	246	490	<50	mg/Kg	50	SW 8015M
TPH as Oil	246	490	<50	mg/Kg	50	SW 8015M
N-octacosane (TPH surr)	246	490	102.0	%		SW 8015M
UST VOLATILES NON-AQUEOUS						SW 8260A
Benzene		77	<0.005	mg/Kg	0.005	SW 8260A

Advisory Control Limits for Blanks:

All compounds should be less than the Reporting Limit, except for phthalate esters, toluene, methylene chloride, acetone and chloroform should be less than 5 times the Reporting Limit.

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QUALITY CONTROL REPORT

BLANK ANALYSIS

ENSR
740 Pasquinelli Drive
Westmont, IL 60559

Mr. Wei-Lin Feng

11/11/1998

NET Job Number: 98.14072

Analyte	Prep Batch Number	Run Batch Number	Blank Analysis Results	Units	Reporting Limit	Analytical Method
Ethylbenzene		77	<0.005	mg/Kg	0.005	SW 8260A
Toluene		77	<0.005	mg/Kg	0.005	SW 8260A
Xylenes, Total		77	<0.005	mg/Kg	0.005	SW 8260A
Dibromofluoromethane (Surr)		77	101.4	%	81-129	SW 8260A
Toluene-d8 (Surr)		77	106.4	%	74-129	SW 8260A
4-Bromofluoromethane (Surr)		77	113.4	%	70-130	SW 8260A
UST VOLATILES NON-AQUEOUS						SW 8260A
Benzene		78	<0.005	mg/Kg	0.005	SW 8260A
Ethylbenzene		78	<0.005	mg/Kg	0.005	SW 8260A
Toluene		78	<0.005	mg/Kg	0.005	SW 8260A
Xylenes, Total		78	<0.005	mg/Kg	0.005	SW 8260A
Dibromofluoromethane (Surr)		78	98.0	%	81-129	SW 8260A
Toluene-d8 (Surr)		78	107.4	%	74-129	SW 8260A
4-Bromofluoromethane (Surr)		78	111.2	%	70-130	SW 8260A
UST VOLATILES NON-AQUEOUS						SW 8260A
Benzene		79	<0.005	mg/Kg	0.005	SW 8260A
Ethylbenzene		79	<0.005	mg/Kg	0.005	SW 8260A
Toluene		79	<0.005	mg/Kg	0.005	SW 8260A
Xylenes, Total		79	<0.005	mg/Kg	0.005	SW 8260A
Dibromofluoromethane (Surr)		79	81.0	%	81-129	SW 8260A
Toluene-d8 (Surr)		79	91.2	%	74-129	SW 8260A
4-Bromofluoromethane (Surr)		79	101.6	%	70-130	SW 8260A
UST VOLATILES NON-AQUEOUS						SW 8260A
Benzene		80	<0.005	mg/Kg	0.005	SW 8260A
Ethylbenzene		80	<0.005	mg/Kg	0.005	SW 8260A
Toluene		80	<0.005	mg/Kg	0.005	SW 8260A
Xylenes, Total		80	<0.005	mg/Kg	0.005	SW 8260A
Dibromofluoromethane (Surr)		80	81.0	%	81-129	SW 8260A
Toluene-d8 (Surr)		80	92.0	%	74-129	SW 8260A

Advisory Control Limits for Blanks:

All compounds should be less than the Reporting Limit, except for phthalate esters, toluene, methylene chloride, acetone and chloroform should be less than 5 times the Reporting Limit.

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NATIONAL ENVIRONMENTAL TESTING, INC.

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QUALITY CONTROL REPORT

BLANK ANALYSIS

ENSR
740 Pasquinelli Drive
Westmont, IL 60559

Mr. Wei-Lin Feng

11/11/1998

NET Job Number: 98.14072

Analyte	Prep Batch Number	Run Batch Number	Blank Analysis Results	Units	Reporting Limit	Analytical Method
4-Bromofluoromethane (Surr)		80	99.0	%	70-130	SW 8260A
PNA CMPDS - 8310 NONAQUEOUS						SW 8310
Acenaphthene	768	1832	<0.020	mg/Kg	0.020	SW 8310
Acenaphthylene	768	1832	<0.020	mg/Kg	0.020	SW 8310
Anthracene	768	1832	<0.040	mg/Kg	0.040	SW 8310
Benzo(a)anthracene	768	1832	<0.0026	mg/Kg	0.0026	SW 8310
Benzo(b)fluoranthene	768	1832	<0.0036	mg/Kg	0.0036	SW 8310
Benzo(k)fluoranthene	768	1832	<0.0034	mg/Kg	0.0034	SW 8310
Benzo(a)pyrene	768	1832	<0.0046	mg/Kg	0.0046	SW 8310
Benzo(ghi)perylene	768	1832	<0.040	mg/Kg	0.040	SW 8310
Chrysene	768	1832	<0.03	mg/Kg	0.03	SW 8310
Dibenzo(a,h)anthracene	768	1832	<0.006	mg/Kg	0.006	SW 8310
Fluoranthene	768	1832	<0.020	mg/Kg	0.020	SW 8310
Fluorene	768	1832	<0.020	mg/Kg	0.020	SW 8310
Indeno(1,2,3-cd)pyrene	768	1832	<0.0086	mg/Kg	0.0086	SW 8310
Naphthalene	768	1832	<0.025	mg/Kg	0.025	SW 8310
Phenanthrene	768	1832	<0.040	mg/Kg	0.040	SW 8310
Pyrene	768	1832	<0.020	mg/Kg	0.020	SW 8310
Surr: p-Terphenyl	768	1832	77.3	%	43-125	SW 8310
PNA CMPDS - 8310 NONAQUEOUS						SW 8310
Acenaphthene	769	1832	<0.020	mg/Kg	0.020	SW 8310
Acenaphthylene	769	1832	<0.020	mg/Kg	0.020	SW 8310
Anthracene	769	1832	<0.040	mg/Kg	0.040	SW 8310
Benzo(a)anthracene	769	1832	<0.0026	mg/Kg	0.0026	SW 8310
Benzo(b)fluoranthene	769	1832	<0.0036	mg/Kg	0.0036	SW 8310
Benzo(k)fluoranthene	769	1832	<0.0034	mg/Kg	0.0034	SW 8310
Benzo(a)pyrene	769	1832	<0.0046	mg/Kg	0.0046	SW 8310
Benzo(ghi)perylene	769	1832	<0.040	mg/Kg	0.040	SW 8310
Chrysene	769	1832	<0.03	mg/Kg	0.03	SW 8310

Advisory Control Limits for Blanks:

All compounds should be less than the Reporting Limit, except for phthalate esters, toluene, methylene chloride, acetone and chloroform should be less than 5 times the Reporting Limit.

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QUALITY CONTROL REPORT

BLANK ANALYSIS

ENSR
740 Pasquinelli Drive
Westmont, IL 60559

11/11/1998

NET Job Number: 98.14072

Mr. Wei-Lin Feng

Analyte	Prep Batch Number	Run Batch Number	Blank Analysis Results	Units	Reporting Limit	Analytical Method
Dibenzo(a,h)anthracene	769	1832	<0.006	mg/Kg	0.006	SW 8310
Fluoranthene	769	1832	<0.020	mg/Kg	0.020	SW 8310
Fluorene	769	1832	<0.020	mg/Kg	0.020	SW 8310
Indeno(1,2,3-cd)pyrene	769	1832	<0.0086	mg/Kg	0.0086	SW 8310
Naphthalene	769	1832	<0.025	mg/Kg	0.025	SW 8310
Phenanthrene	769	1832	<0.040	mg/Kg	0.040	SW 8310
Pyrene	769	1832	<0.020	mg/Kg	0.020	SW 8310
Surr: p-Terphenyl	769	1832	78.0	%	43-125	SW 8310
PCB'S NON-AQUEOUS						SW 8082
PCB-1016	382	58	<0.040	mg/Kg	0.040	SW 8082
PCB-1221	382	58	<0.040	mg/Kg	0.040	SW 8082
PCB-1232	382	58	<0.040	mg/Kg	0.040	SW 8082
PCB-1242	382	58	<0.040	mg/Kg	0.040	SW 8082
PCB-1248	382	58	<0.040	mg/Kg	0.040	SW 8082
PCB-1254	382	58	<0.040	mg/Kg	0.040	SW 8082
PCB-1260	382	58	<0.040	mg/Kg	0.040	SW 8082
Decachlorobiphenyl (Surr)	382	58	86.0	%	NA	SW 8082
2,4,5,6-TCMX (Surr)	382	58	80.0	%	NA	SW 8082
PCB'S NON-AQUEOUS						SW 8082
PCB-1016	382	58	<0.040	mg/Kg	0.040	SW 8082
PCB-1221	382	58	<0.040	mg/Kg	0.040	SW 8082
PCB-1232	382	58	<0.040	mg/Kg	0.040	SW 8082
PCB-1242	382	58	<0.040	mg/Kg	0.040	SW 8082
PCB-1248	382	58	<0.040	mg/Kg	0.040	SW 8082
PCB-1254	382	58	<0.040	mg/Kg	0.040	SW 8082
PCB-1260	382	58	<0.040	mg/Kg	0.040	SW 8082
Decachlorobiphenyl (Surr)	382	58	84.0	%	NA	SW 8082
2,4,5,6-TCMX (Surr)	382	58	78.0	%	NA	SW 8082
PCB'S NON-AQUEOUS						SW 8082

Advisory Control Limits for Blanks:

All compounds should be less than the Reporting Limit, except for phthalate esters, toluene, methylene chloride, acetone and chloroform should be less than 5 times the Reporting Limit.

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QUALITY CONTROL REPORT

BLANK ANALYSIS

ENSR
740 Pasquinelli Drive
Westmont, IL 60559

Mr. Wei-Lin Feng

11/11/1998

NET Job Number: 98.14072

Analyte	Prep Batch Number	Run Batch Number	Blank Analysis Results	Units	Reporting Limit	Analytical Method
PCB-1016	381	53	<0.040	mg/Kg	0.040	SW 8082
PCB-1221	381	53	<0.040	mg/Kg	0.040	SW 8082
PCB-1232	381	53	<0.040	mg/Kg	0.040	SW 8082
PCB-1242	381	53	<0.040	mg/Kg	0.040	SW 8082
PCB-1248	381	53	<0.040	mg/Kg	0.040	SW 8082
PCB-1254	381	53	<0.040	mg/Kg	0.040	SW 8082
PCB-1260	381	53	<0.040	mg/Kg	0.040	SW 8082
Decachlorobiphenyl (Surr)	381	53	84.0	%	NA	SW 8082
2,4,5,6-TCMX (Surr)	381	53	67.0	%	NA	SW 8082

Advisory Control Limits for Blanks:

All compounds should be less than the Reporting Limit, except for phthalate esters, toluene, methylene chloride, acetone and chloroform should be less than 5 times the Reporting Limit.

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QUALITY CONTROL REPORT

LABORATORY CONTROL STANDARD

ENSR
740 Pasquinelli Drive
Westmont, IL 60559

11/11/1998

NET Job Number: 98.14072

Mr. Wei-Lin Feng

Analyte	Prep Batch Number	Run Batch Number	True Conc.	Conc. Found	LCS % Recovery
Arsenic, GFAA	236	674	0.50	0.55	110.0
Arsenic, GFAA	238	673	0.0100	0.0117	117.0
Arsenic, GFAA	239	675	0.0100	0.0098	98.0
Barium, ICP	1169	2188	50.0	53.0	106.0
Barium, ICP	1172	2194	5.00	5.18	103.6
Barium, ICP	1173	2194	5.00	5.11	102.2
Cadmium, ICP	1169	2174	2.50	2.61	104.4
Cadmium, ICP	1172	2178	2.50	2.71	108.4
Cadmium, ICP	1173	2178	2.50	2.53	101.2
Chromium, ICP	1169	2159	5.00	5.40	108.0
Chromium, ICP	1172	2163	5.00	5.80	116.0
Chromium, ICP	1173	2163	5.00	5.30	106.0
Lead, ICP	1169	2397	5.00	6.15	123.0
Lead, ICP	1172	2401	5.00	5.80	116.0
Lead, ICP	1173	2401	5.00	6.25	125.0
Mercury, CVAA	666	770	0.0025	0.00248	99.2
Mercury, CVAA		770	0.0020	0.00165	82.5
Mercury, CVAA	668	772	0.0025	0.00275	110.0
Mercury, CVAA		772	0.0020	0.00204	102.0
Selenium, GFAA	236	562	0.50	0.58	116.0
Selenium, GFAA	238	562	0.50	0.60	120.0
Selenium, GFAA	239	563	0.0100	0.0098	98.0
Silver, AA	494	571	0.10	0.089	89.0
Silver, AA	496	572	0.10	0.107	107.0
TPH MODIFIED 8015					
TPH as Gas	246	490	250	159	63.6
TPH as Diesel	246	490	250	207	82.8
TPH as Oil	246	490	250	202	80.8
N-octacosane (TPH surr)	246	490	100	110	110.0
UST VOLATILES NON-AQUEOUS					
Benzene		77	20.0	21.8	109.0

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QUALITY CONTROL REPORT

LABORATORY CONTROL STANDARD

ENSR
740 Pasquinelli Drive
Westmont, IL 60559

11/11/1998

NET Job Number: 98.14072

Mr. Wei-Lin Feng

Analyte	Prep Batch Number	Run Batch Number	True Conc.	Conc. Found	LCS % Recovery
Ethylbenzene		77	20.0	21.8	109.0
Toluene		77	20.0	20.8	104.0
Xylenes, Total		77	60.0	63.4	105.7
Dibromofluoromethane (Surr)		77	50.0	50.2	100.4
Toluene-d8 (Surr)		77	50.0	52.0	104.0
4-Bromofluoromethane (Surr)		77	50.0	56.5	113.0
UST VOLATILES NON-AQUEOUS					
Benzene		78	20.0	21.0	105.0
Ethylbenzene		78	20.0	20.7	103.5
Toluene		78	20.0	20.1	100.5
Xylenes, Total		78	60.0	61.6	102.7
Dibromofluoromethane (Surr)		78	50.0	48.1	96.2
Toluene-d8 (Surr)		78	50.0	51.4	102.8
4-Bromofluoromethane (Surr)		78	50.0	55.2	110.4
UST VOLATILES NON-AQUEOUS					
Benzene		79	20.0	20.6	103.0
Ethylbenzene		79	20.0	20.3	101.5
Toluene		79	20.0	19.3	96.5
Xylenes, Total		79	60.0	59.4	99.0
Dibromofluoromethane (Surr)		79	50.0	42.5	85.0
Toluene-d8 (Surr)		79	50.0	48.5	97.0
4-Bromofluoromethane (Surr)		79	50.0	50.5	101.0
UST VOLATILES NON-AQUEOUS					
Benzene		80	20.0	19.0	95.0
Ethylbenzene		80	20.0	19.0	95.0
Toluene		80	20.0	19.0	95.0
Xylenes, Total		80	60.0	58.0	96.7
Dibromofluoromethane (Surr)		80	50.0	45.0	90.0
Toluene-d8 (Surr)		80	50.0	49.0	98.0
4-Bromofluoromethane (Surr)		80	50.0	55.0	110.0
PNA CMPDS - 8310 NONAQUEOUS					

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QUALITY CONTROL REPORT

LABORATORY CONTROL STANDARD

ENSR
740 Pasquinelli Drive
Westmont, IL 60559

11/11/1998

NET Job Number: 98.14072

Mr. Wei-Lin Feng

Analyte	Prep Batch Number	Run Batch Number	True Conc.	Conc. Found	LCS % Recovery
Acenaphthene	768	1832	0.033	0.028	84.8
Acenaphthylene	768	1832	0.033	0.029	87.9
Anthracene	768	1832	0.033	0.030	90.9
Benzo(a)anthracene	768	1832	0.033	0.031	93.9
Benzo(b)fluoranthene	768	1832	0.033	0.028	84.8
Benzo(k)fluoranthene	768	1832	0.033	0.028	84.8
Benzo(a)pyrene	768	1832	0.033	0.029	87.9
Benzo(ghi)perylene	768	1832	0.033	0.028	84.8
Chrysene	768	1832	0.033	0.031	93.9
Dibenzo(a,h)anthracene	768	1832	0.033	0.029	87.9
Fluoranthene	768	1832	0.033	0.030	90.9
Fluorene	768	1832	0.033	0.030	90.9
Indeno(1,2,3-cd)pyrene	768	1832	0.033	0.028	84.8
Naphthalene	768	1832	0.033	0.028	84.8
Phenanthrene	768	1832	0.033	0.029	87.9
Pyrene	768	1832	0.033	0.033	100.0
Surr: p-Terphenyl	768	1832	2000	1,742	87.1
PNA CMPDS - 8310 NONAQUEOUS					
Acenaphthene	769	1832	0.033	0.028	84.8
Acenaphthylene	769	1832	0.033	0.032	97.0
Anthracene	769	1832	0.033	0.028	84.8
Benzo(a)anthracene	769	1832	0.033	0.030	90.9
Benzo(b)fluoranthene	769	1832	0.033	0.025	75.8
Benzo(k)fluoranthene	769	1832	0.033	0.032	97.0
Benzo(a)pyrene	769	1832	0.033	0.030	90.9
Benzo(ghi)perylene	769	1832	0.033	0.026	78.8
Chrysene	769	1832	0.033	0.031	93.9
Dibenzo(a,h)anthracene	769	1832	0.033	0.026	78.8
Fluoranthene	769	1832	0.033	0.028	84.8
Fluorene	769	1832	0.033	0.027	81.8
Indeno(1,2,3-cd)pyrene	769	1832	0.033	0.027	81.8

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QUALITY CONTROL REPORT

LABORATORY CONTROL STANDARD

ENSR
740 Pasquinelli Drive
Westmont, IL 60559

11/11/1998

NET Job Number: 98.14072

Mr. Wei-Lin Feng

Analyte	Prep Batch Number	Run Batch Number	True Conc.	Conc. Found	LCS % Recovery
Naphthalene	769	1832	0.033	0.022	66.7
Phenanthrene	769	1832	0.033	0.026	78.8
Pyrene	769	1832	0.033	0.030	90.9
Surr: p-Terphenyl	769	1832	2000	1,593	79.7
PCB'S NON-AQUEOUS					
PCB-1016	382	58	500	487	97.4
PCB-1260	382	58	500	475	95.0
Decachlorobiphenyl (Surr)	382	58	100	95	95.0
2,4,5,6-TCMX (Surr)	382	58	100	87	87.0
PCB'S NON-AQUEOUS					
PCB-1016	382	58	500	400	80.0
PCB-1260	382	58	500	419	83.8
Decachlorobiphenyl (Surr)	382	58	100	79	79.0
2,4,5,6-TCMX (Surr)	382	58	100	70	70.0
PCB'S NON-AQUEOUS					
PCB-1016	381	53	500	440	88.0
PCB-1260	381	53	500	454	90.8
Decachlorobiphenyl (Surr)	381	53	100	92	92.0
2,4,5,6-TCMX (Surr)	381	53	100	81	81.0

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QUALITY CONTROL REPORT

DUPLICATES

ENSR
740 Pasquinelli Drive
Westmont, IL 60559

11/11/1998

NET Job Number: 98.14072

Mr. Wei-Lin Feng

Analyte	Prep Batch Number	Run Batch Number	Original Analysis	Duplicate Analysis	Units	RPD
pH, Non-Aqueous		196	7.44	7.52	units	1.1
pH, Non-Aqueous		197	9.16	9.18	units	0.2
pH, Non-Aqueous		198	8.89	8.97	units	0.9
Solids, Total		2528	88.9	88.7	%	0.2
Solids, Total		2528	53.0	53.7	%	1.3
Solids, Total		2529	97.4	97.8	%	0.4

NOTE: Spikes and Duplicates may not be samples from this job.

RPD - Relative Percent Difference

Advisory Control Limits for Duplicates - RPD should be less than 20.

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NET Midwest, Bartlett Division

KEY TO ABBREVIATIONS and METHOD REFERENCES

<	:	Less than; When appearing in the results column indicates the analyte was not detected at or above the reported value.
mg/L	:	Concentration in units of milligrams of analyte per liter of sample. Measurement used for aqueous samples. Can also be expressed as parts per million (ppm).
ug/g	:	Concentration in units of micrograms of analyte per gram of sample. Measurement used for non-aqueous samples. Can also be expressed as parts per million (ppm) or mg/Kg.
ug/L	:	Concentration in units of micrograms of analyte per liter of sample. Measurement used for aqueous samples. Can also be expressed as parts per billion (ppb).
ug/Kg	:	Concentration in units of micrograms of analyte per kilogram of sample. Measurement used for non-aqueous samples. Can also be expressed as parts per billion (ppb).
TCLP	:	These initials appearing in front of an analyte name indicate that the Toxicity Characteristic Leaching Procedure (TCLP) was performed for this test.
Surr:	:	These initials are the abbreviation for surrogate. Surrogates are compounds that are chemically similar to the compounds of interest. They are part of the method quality control requirements.
%	:	Percent; To convert ppm to %, divide the result by 10,000. To convert % to ppm, multiply the result by 10,000.
ICP	:	Indicates analysis was performed using Inductively Coupled Plasma Spectroscopy.
AA	:	Indicates analysis was performed using Atomic Absorption Spectroscopy.
GFAA	:	Indicates analysis was performed using Graphite Furnace Atomic Absorption Spectroscopy.
PQL	:	Practical Quantitation Limit; the lowest level that can be reliably achieved within specified limits of precision and accuracy during routine laboratory operating conditions.

Method References

(1) Methods 1000 through 9999: see "Test Methods for Evaluating Solid Waste", USEPA SW-846, 3rd Edition, 1986.

(2) ASTM "American Society for Testing Materials"

(3) Methods 100 through 499: see "Methods for Chemical Analysis of Water and Wastes", USEPA, 600/4-79-020, Rev. 1983.

(4) See "Standard Methods for the Examination of Water and Wastewater", 17th Ed, APHA, 1989.

(5) Methods 600 through 625: see "Guidelines Establishing Test Procedures for the Analysis of Pollutants", USEPA Federal Register Vol. 49 No. 209, October 1984.

(6) Methods 500 through 599: see "Methods for the Determination of Organic Compounds in Drinking Water," USEPA 600/4-88/039, Rev. 1988.

(7) See "Methods for the Determination of Metals in Environmental Samples", Supplement I EPA-600/R-94/111, May 1994.

(8) See "Standard Methods for the Examination of Water and Wastewater", 18th Ed., APHA, 1992.

(9) Methods 1000 through 9999: see "Test Methods for Evaluating Solid Waste", USEPA SW-846, 3rd Edition, 1986, Including Updates I and II.

(10) This method is from the 2nd Edition of "Test Methods for Evaluating Solid Waste", USEPA SW-846. It has been dropped from the 3rd Edition, 1986.

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NET NATIONAL ENVIRONMENTAL TESTING, INC.

CHAIN OF CUSTODY RECORD

COMPANY ENSR Corp.
ADDRESS 740 Pasquinelli Dr.
PHONE (630) 8671700 FAX (630) 8505307
PROJECT NAME/LOCATION ComEd Waukegan
PROJECT NUMBER 18010230010
PROJECT MANAGER Weilin Feng / Karen Dolmics

REPORT TO: K. Dolmics
INVOICE TO: ENSR
P.O. NO.
NET QUOTE NO.

SAMPLED BY B. Buckley (PRINT NAME) B. Buckley SIGNATURE
(PRINT NAME) SIGNATURE

DATE 1998	TIME	SAMPLE ID/DESCRIPTION	MATRIX	GRAB	COMP	# and Type of Containers: HCl	NaOH	HNO_3	H_2SO_4	OTHER	ANALYSES: pH 9045	PNAs 8310	BTEX 8260	PCBs 8081	PCMA metals (4 total)	TPH 8015
10/29	910	B10 (0-4)	S	X						2	X	X	X	X	X	
10/29	920	B11 (0-4)	S	X						2	X	X	X	X	X	
10/29	930	B9 (0-4)	S	X						2	X	X	X	X	X	
10/29	935	B8 (0-4)	S	X						2	X	X	X	X	X	
10/29	955	B6 (0-4)	S	X						2	X	X	X	X	X	
10/29	1000	B7 (0-4)	S	X						2	X	X	X	X	X	
10/29	1110	B1 (0-4)	S	X						2	X	X	X	X	X	
10/29	1130	B15 (0-4)	S	X						2	X	X	X	X	X	
10/29	1255	B17 (0-4)	S	X						2	X	X	X	X	X	
10/29	1345	S11	S	X						2	X	X	X	X	X	X
10/29	1410	X4	S	X						2	X	X	X	X	X	X
10/29	1430	X1	S	X						2	X	X	X	X	X	X
10/29	1440	X2	S	X						2	X	X	X	X	X	X
10/29	1450	S6	S	X						2	X	X	X	X	X	X
10/29	1425	X3	S	X						2	X	X	X	X	X	X

To assist us in selecting the proper method
Is this work being conducted for regulatory compliance monitoring? Yes ___ No ___
Is this work being conducted for regulatory enforcement action? Yes ___ No ___
Which regulations apply: RCRA ___ NPDES Wastewater ___ UST ___ Drinking Water ___ Other ___ None ___

COMMENTS

CONDITION OF SAMPLE: BOTTLES INTACT? (YES) NO FIELD FILTERED? ~~YES / NO~~ N/A
COC SEALS PRESENT AND INTACT? (YES) / NO VOLATILES FREE OF HEADSPACE? (YES) / NO
TEMPERATURE UPON RECEIPT: 2.3°C wetice
Bottles supplied by NET? (YES) / NO

SAMPLE REMAINDER DISPOSAL: RETURN SAMPLE REMAINDER TO CLIENT VIA ___
I REQUEST NET TO DISPOSE OF ALL SAMPLE REMAINDERS ___ DATE ___

RELINQUISHED BY:	DATE	TIME	RECEIVED BY:	RELINQUISHED BY:	DATE	TIME	RECEIVED FOR NET BY:
B. Buckley	10/29/98	1430			10/30/98	1245	P. Muriel

METHOD OF SHIPMENT: Net Pick up @ office
REMARKS:

ORIGINAL WHITE NET PROJECT MANAGER YELLOW CUSTOMER COPY

NET NATIONAL ENVIRONMENTAL TESTING, INC.

CHAIN OF CUSTODY RECORD

COMPANY ENSR Corp.
ADDRESS 740 Pasquinelli Dr. St. 124 Westmont, IL
PHONE (630) 887-1700 FAX (630) 850 5307
PROJECT NAME/LOCATION ComEd / Waukegan
PROJECT NUMBER 18010 23610
PROJECT MANAGER Wei-Lin Feng / Karen Dolinos

REPORT TO: K. Dolinos
INVOICE TO: ENSR
P.O. NO.
NET QUOTE NO.

SAMPLED BY B. Buckley (PRINT NAME) B. Buckley SIGNATURE
(PRINT NAME) SIGNATURE

DATE	TIME	SAMPLE ID/DESCRIPTION	MATRIX	GRAB	COMP	# and Type of Containers: HCl	NaOH	HNO_3	H_2SO_4	OTHER	ANALYSES: PH 9045	PNAs 8310	BTEX 8260	PCBs 8081	RCRA Metals (totals)	TPH 8015
10/29	1540	~~X4~~ X5	S	X						2	X	X	X	X	X	X
10/29	1550	~~X5~~ X6	S	X						2	X	X	X	X	X	X

To assist us in selecting the proper method
Is this work being conducted for regulatory compliance monitoring? Yes ___ No ___
Is this work being conducted for regulatory enforcement action? Yes ___ No ___
Which regulations apply: RCRA ___ NPDES Wastewater ___ UST ___ Drinking Water ___ Other ___ None ___

COMMENTS

CONDITION OF SAMPLE: BOTTLES INTACT? (YES) NO FIELD FILTERED? ~~YES / NO~~ N/A
COC SEALS PRESENT AND INTACT? (YES) NO VOLATILES FREE OF HEADSPACE? (YES) NO
TEMPERATURE UPON RECEIPT: 2.3°C w/ice Bottles supplied by NET? (YES) NO

SAMPLE REMAINDER DISPOSAL: RETURN SAMPLE REMAINDER TO CLIENT VIA ___
I REQUEST NET TO DISPOSE OF ALL SAMPLE REMAINDERS ___ DATE ___

RELINQUISHED BY:	DATE	TIME	RECEIVED BY:	RELINQUISHED BY:	DATE	TIME	RECEIVED FOR NET BY:
B Buckley	10/29	1615			10/30/98	1245	P. Merrill

METHOD OF SHIPMENT Net Pick up - offsite
REMARKS:

ORIGINAL - NET PROJECT MANAGER YELLOW - CUSTOMER COPY

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APPENDIX C

Monitoring Well Gauging and Survey Data

Phase II Environmental Site Assessment
Commonwealth Edison Company
December 7, 1998

Waukegan Generating Station
10 Greenwood Avenue
Waukegan, Illinois

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Project: ComEd Waukegan Generating Station
Project #: 1801-023-610
Date: 10/28/98

Operator: BM
Method: IP
Equipment #: IP #

Well ID	TOC Elevation (feet)	Total Depth of Well (feet)	Depth to Water (feet)	Depth to LPHC (feet)	LPHC Thickness (feet)	LPHC Specific Gravity	Corrective Depth to Water (feet)	Corrective Water Elevation (feet)
MW-2	96.58	8.17	1.71	NA	NA	NA	1.71	94.87
MW-3	97.81	8.13	1.30	NA	NA	NA	1.30	96.51
MW-5	98.24	8.38	3.69	NA	NA	NA	3.69	94.55
MW-6	98.36	9.78	7.48	NA	NA	NA	7.48	90.88
MW-7	96.42	9.51	4.25	NA	NA	NA	4.25	92.17
MW-11	98.75	12.83	3.04	NA	NA	NA	3.04	95.71
MW-12	99.18	14.95	3.47	NA	NA	NA	3.47	95.71

Note:
TOC elevation is based on an arbitrary 100 foot benchmark.

r.chicago\project\h171\comed\fossil\gaugdata(waukegan).xls

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Exhibit

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Commonwealth Edison Company

Chicago, Illinois

Phase I Environmental Site Assessment of Commonwealth Edison Waukegan Generating Station, 10 Greenwood Avenue, Waukegan, Illinois.

ENSR Consulting – Engineering – Remediation

October 1998

Document Number 1801-023-600

COMP. EX. 38

MWG13-15_12003

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MWG13-15_12006

1.0 INTRODUCTION

1.1 Objectives and Scope of Work

ENSR was retained by Commonwealth Edison (ComEd) to perform a Phase I Environmental Site Assessment of the Waukegan Generating Station facility located at 10 Greenwood Avenue in Waukegan, Illinois.

The purpose of this Phase I ESA was to assess the environmental status of the subject site with regard to "recognized environmental conditions", which are defined by the ASTM (see E 1527-97) as, "the presence or likely presence of any hazardous substances or petroleum products on a property under conditions that indicate an existing release, a past release, or a material threat of a release of any hazardous substances or petroleum products into structures on the property or into the ground, groundwater, or surface water of the property." According to the ASTM, "the term is not intended to include *de minimis* conditions that generally do not present a material risk of harm to public health or the environment and that generally would not be the subject of an enforcement action if brought to the attention of appropriate government agencies."

The ESA was conducted in accordance with the Standard Practice for Environmental Site Assessments: Phase I Environmental Site Assessment Process established by the ASTM (ASTM Designation E-1527-97).

1.2 Study Limitations

This report describes the results of ENSR's initial due diligence investigation to identify the presence of recognized environmental conditions affecting the subject facility and/or property. In the conduct of this due diligence investigation, ENSR has attempted to independently assess the presence of such problems within the limits of the established scope of work, as described in ENSR's July 31, 1998, proposal.

As with any due diligence evaluation, there is a certain degree of dependence upon oral information provided by facility or site representatives which is not readily verifiable through visual inspection or supported by any available written documentation. ENSR shall not be held responsible for conditions or consequences arising from relevant facts that were misconstrued, concealed, withheld, or not fully disclosed by facility or site representatives at the time this investigation was performed.

MWG13-15_12007

This report and all field data and notes were gathered and/or prepared by ENSR in accordance with the agreed upon scope of work and generally accepted engineering and scientific practice in effect at the time of ENSR's investigation of the site.

This report, including all supporting field data and notes (collectively referred to hereinafter as "information"), was prepared or collected by ENSR for the benefit of its Client, Commonwealth Edison (ComEd). ENSR's Client may release the information to other third parties, whom may use and rely upon the information to the same extent as ENSR's Client. However, any use of or reliance upon the information by a party other than specifically named above shall be solely at the risk of such third party and without legal recourse against ENSR, its parent or its subsidiaries and affiliates, or their respective employees, officers or directors, regardless of whether the action in which recovery of damages is sought is based upon contract, tort (including the sole, concurrent or other negligence and strict liability of ENSR), statute or otherwise. This information shall not be used or relied upon by a party that does not agree to be bound by the above statement.

1.3 Report Organization

ENSR reviewed a substantial volume of information regarding the ComEd facility during the course of this Phase I assessment. This report represents our best efforts to synthesize the most salient information collected and reviewed. The report contains the following sections:

- *Chapter 2: Site Location and Description*, provides an overview of the subject property, including a description of the site history and a discussion of the various activities currently taking place.

- *Chapter 3: Environmental Document Review*, provides a description of ComEd's documents reviewed at each facility and at ComEd's corporate office. The document review included only materials that pertained to site contamination and not documents regarding environmental regulatory compliance.

- *Chapter 4: On-Site Contamination Potential*, evaluates the subject property for the presence of a hazardous material or petroleum hydrocarbon contamination problem due to past or present activities taking place on the site. This analysis also considers land uses in the immediate vicinity that may adversely affect the subject property through off-site migration of contaminants from known releases.

- *Chapter 5: Summary of Findings*, provides our summary regarding recognized environmental conditions.

- *Chapter 6: References*, identifies the various sources of information used in the preparation of this report, including persons interviewed, and documents and files evaluated.

- *Chapter 7: Signatures and Quality Control Review*, identifies the report author and individual responsible for conducting senior review.

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2.0 SITE LOCATION AND DESCRIPTION

2.1 Site Location

ComEd operates a coal fueled electric power generating facility known as Waukegan Station, located at 10 Greenwood Avenue in Waukegan, Illinois. The subject property is located in the northeast side of the city of Waukegan, at Greenwood Avenue and Lake Michigan.

The subject property is bordered to the north by Greenwood Avenue, beyond which is the Johns Manville Corporation. To the east is Lake Michigan and to the west are the station's main electrical switching yards, a wood chip staging/recycling area, and a construction material excavation area owned by ComEd. To the south is the North Shore Sanitary District (a wastewater treatment facility). Access to the subject property is from Greenwood Avenue to the north. Figure 2-1 is a site location map.

2.2 Description of Property and Facility Layout

The subject property encompasses approximately 194 acres and is occupied by the main generating building near the north central portion of the property, and several other ancillary buildings, settling basins, and conveyors. Rail lines pass through the site from northwest to southeast on the west and south sides of the main building. Low sulfur coal is mined in the Powder River Basin area of northeast Wyoming and delivered to the Waukegan Station via the Chicago & Northwestern Railroad. The delivered coal is staged in an uncovered coal storage area with a capacity of over 750,000 tons, located to the southeast of the main building. Storm water runoff from the coal pile is contained in the coal pile runoff basin located west of the coal pile and southwest of the main building. Cooling water is drawn from Lake Michigan and returned to the lake through a canal system. The canals are periodically dredged and the sediments (i.e. beach sand) are stored in piles along the eastern boundary of the subject property. Bottom ash and slag settles out in two synthetically-lined basins located south of the main building. Site runoff is collected and directed to either of two wastewater treatment settling basins located northeast and southwest of the main building. The wastewater basins are lined with packed clay. Sanitary waste produced at the station is piped off-site to the North Shore Sanitary District for treatment and disposal. Figure 2-2 is a site plan for the facility.

The main structure on the subject property was originally constructed in 1923 with several building additions occurring from 1925 to 1962. The main building is 16-stories at the tallest point and is a steel framed, brick and metal sided building that houses three active electric generating units (i.e.

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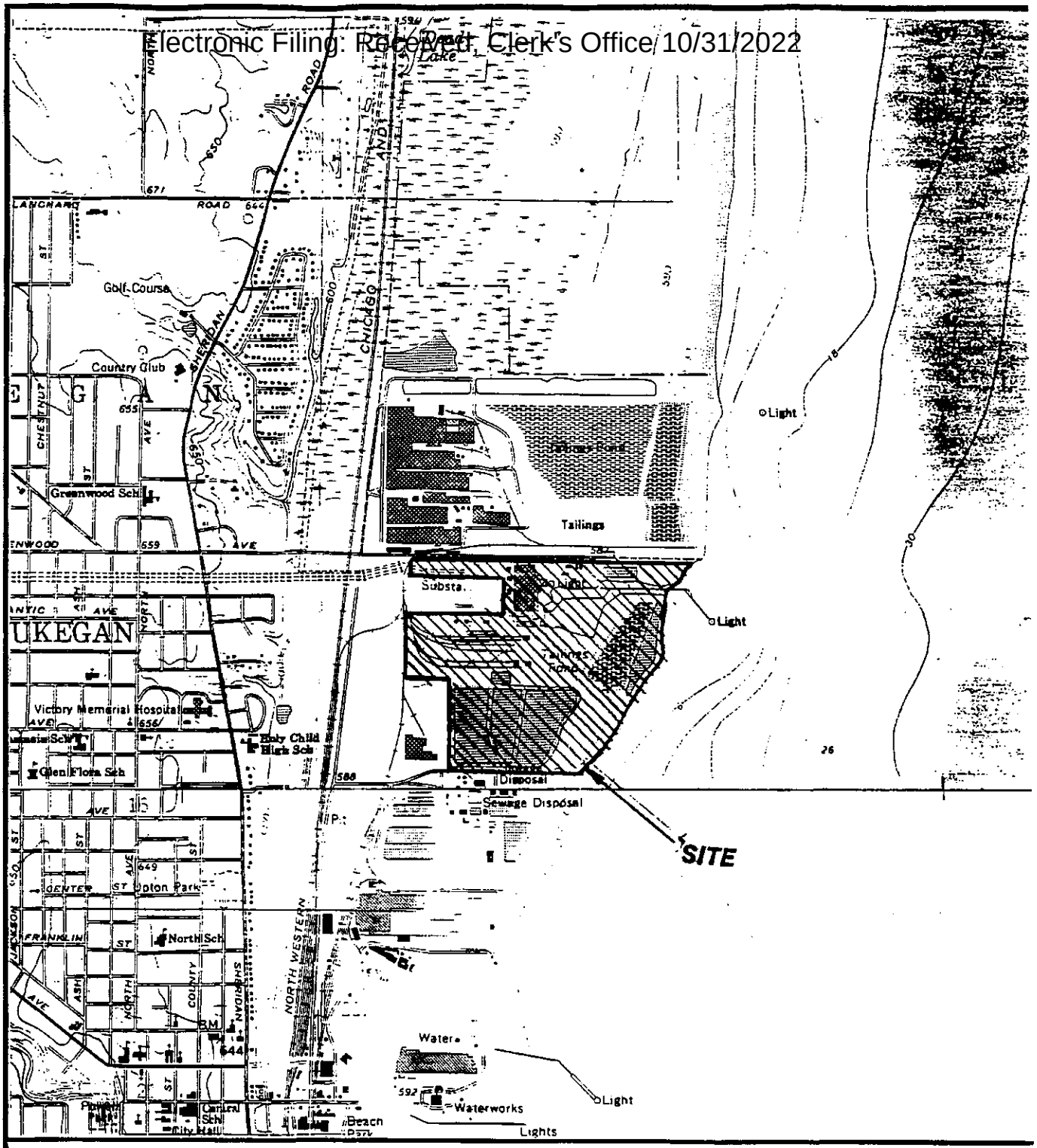


N

U.S.G.S.
ZION, IL, &
WAUKEGAN, IL.

SITE LOCATION MAP

WAUKEGAN GENERATING STATION
10 GREENWOOD AVENUE
WAUKEGAN, ILLINOIS

COMMONWEALTH EDISON COMPANY

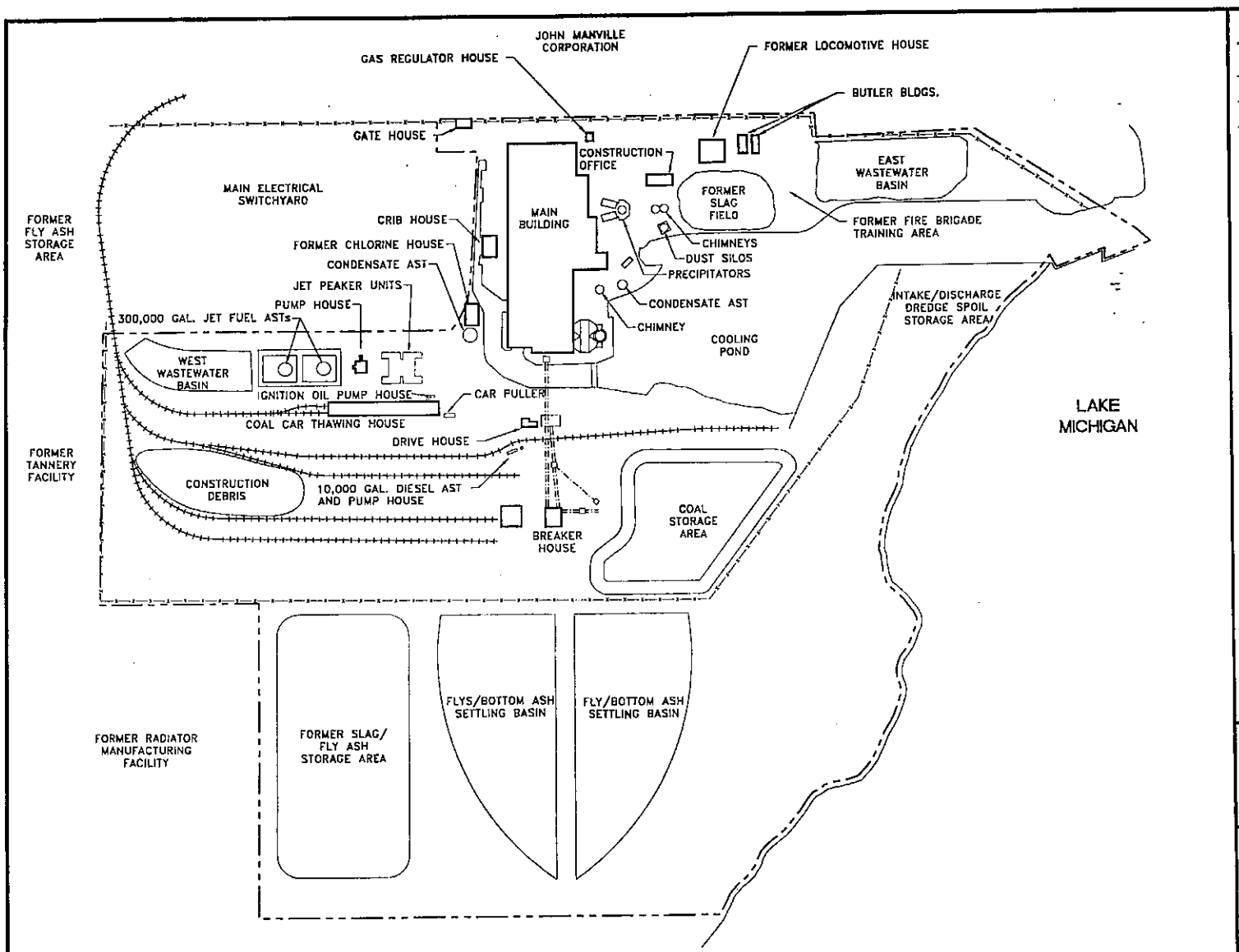
September 1998 File No: 1801-023-600

FIGURE 1

ENSR

Dwg No: WAUKEGANSL1

MWG13-15_12011



LEGEND:

- PROPERTY BOUNDARY
- RAILROAD LINE
- FENCE
- CONVEYOR LINE

Note:
- All dimensions and locations are approximate.

Source:
- ENSR field observations.

Dwg No: WAUKEGAN

WAUKEGAN GENERATING STATION NO. 16
10 GREENLAND AVENUE
WAUKEGAN, ILLINOIS

COMMONWEALTH EDISON COMPANY

September 1998 File No: 1801-023-600

SITE PLAN

N

NOT TO SCALE

FIGURE 2

ENSR

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Units #6 through #8). The main building also contains Units #1 through #5 that were in service from the early 1920s through the late 1970s, at which time were all retired and decommissioned. Units #1 through #4 were deemed inaccessible by ComEd personnel, and therefore not inspected by ENSR during the site visit. The turbines associated with Units #1 through #4 have been removed from the facility, but Unit #5 remains substantially intact. Units #1 and #2 were each equipped with a single generator unit and three boilers. Unit #3 was equipped with a single generator unit and four boilers. Units #4 and #5 were each equipped with a single generator unit and three boilers.

Unit #6 was brought on line in 1952 and is equipped with a single generator unit and one boiler. Unit #7 and Unit #8 were brought on line in 1958 and 1962, respectively, and are each equipped with a single generator and a 16-story boiler. The main building also contains offices and employee locker rooms. The main stack for Units #6 through #8 extends from the roof of the main building to a height of 450 feet above surrounding grade. Air emission control equipment (i.e. electrostatic precipitators) is mounted in a structure on the roof of the main building. Main and auxiliary transformers are located outside the east and west sides of the main building.

The subject property consists of numerous outlying structures and facilities, which are described as follows starting with the coal storage area in the southeast and moving clockwise around the main building. The main coal storage area is located southeast of the main building. Coal storage area related structures include two bottom ash settling basins, a coal pile-runoff ditch and settling basin, a tractor repair building, machine shed, coal pile chemical building, coal handling equipment storage building, breaker house, conveyors, 10,000-gallon diesel AST (tractor fueling station), train car "drive house", train car "dump house". The main wastewater house, wastewater collection and make-up aboveground storage tanks (ASTs), wastewater pump house, and wastewater treatment/storage system including clarifiers are located north/northwest of the coal pile handling structures. West of wastewater structures is the ignition fuel pump house, coal car "thawing house", carbon dioxide AST, jet-fuel fired "peaker" units, peaker pump house/mechanics shed, two 300,000-gallon jet-fuel ASTs, west wastewater collection basin, 5,000-gallon west basin waste oil separator, and 7,500-gallon west basin waste oil AST. The main electrical switching yard, containing numerous large capacitors, is located just north of the jet-fuel peaker area. It should be noted: for the purpose of this report that the switchyard is not considered part of the subject property. South and west of the main building is the intake channel, lawn equipment storage shed (old chlorine house), nitrogen AST, wastewater AST, and crib house. Various transformers and capacitors are located west of the main building and expand westward into the switchyard. Northwest of the main building is the main gate house with a paved parking lot and Greenwood Avenue to the north. Northwest of the main building is the east gate house, paved parking lots, 500-gallon diesel AST, 500-gallon gasoline AST, old locomotive house, two butler buildings, fire brigade area, east wastewater building, east wastewater collection basin, 8,000-gallon east wastewater oil water separator, and 7,500-gallon east wastewater waste oil AST. East

MWG13-15_12013

of the main building is a group of structures consisting of the ash silos, welding shop, cooling water discharge channel, intake channel and lake intake dredge storage piles.

2.3 Topography, Hydrology, and Geology

According to the USGS Zion, Illinois Quadrangle 7.5 Minute Series Topographic map, the topographic elevation of the main building and lakefront area is approximately 590 feet above mean sea level. The developed portion of the subject property slopes easterly toward Lake Michigan.

According to the USDA SCS Soil Survey for Lake County, Illinois, the soils on the subject property consist of mostly sand and silty loams, and the estimated depth to shallow groundwater is between five and ten feet below grade surface (bgs). The groundwater in the region is expected to flow toward Lake Michigan, which is located adjacent to the east of the subject property. In addition, subsurface investigations previously conducted identified glacial till and stratified outwash deposits on-site. Areas of fill were also identified and consist of silty sand, clayey sand, slag and fly ash. Bedrock at the site was identified as limestone ranging in depth from 50 to 100 feet below grade.

2.4 Site History

Historical information for the subject site is based on a review of building department records, tax assessors records, aerial photographs, Sanborn Fire Insurance maps, a topographic quadrangle map, city directories, ComEd files, and interviews from site personnel and local government officials.

A 1939 aerial photograph shows the subject property to be occupied by a coal-fired power plant. The facility appears to be approximately one-half the size of the current facility. A coal pile is depicted on the southeastern portion of the subject property with fly-ash and slag piles located on the south and west portions of the subject property, respectively. The west wastewater treatment settling basin and the fly-ash/bottom ash settling basins were not depicted on this photograph.

A 1959 aerial photograph shows expansion of the coal-fired power plant. The main building has been expanded in a southerly direction. The outlying structures appeared the same as the 1939 aerial photograph.

Aerial photographs dated 1964, 1975, 1985, 1990, and 1995 show the subject property virtually as it currently exists with the main building occupying the majority of the subject property. Fly-ash/bottom ash, east and west wastewater settling basins, and intake canal dredge spoil piles are depicted in their current locations.

MWG13-15_12014

According to building department records, several permits were issued between 1979 and 1995 for the following activities:

- Building Permit #9880 issued in 1979 was for the construction of a 12' X 12' metal meter house.
- Building Permit #0240 issued in 1982 was for the installation of a new roof on an unspecified ComEd structure. In addition, the permit covered the installation of wastewater treatment facilities consisting of chemical control buildings, pump and filter building, two clarifiers, three oil water separators, five collection basins, chemical feed equipment, related piping, and appurtenances.
- Building Permit #3397 issued in 1984 was for the construction of a 3,850 square foot storage building.
- Building Permit #5484 issued in 1985 was to erect a heavy equipment storage shed.
- Building Permit #9071 issued in 1987 was for the installation of two sloped loading docks with automatic door openers and weather protection devices.
- Building Permit #003 issued in 1995 to demolish an unspecified ComEd building.

Assessment records indicate the subject property was occupied by the Public Service Company of Northern Illinois from approximately 1923 until 1953. In 1953, ComEd acquired the property through a merger with the former power company.

The USGS Zion, Illinois Quadrangle Topographic map dated 1960, photorevised in 1972 and 1980, shows the subject property to be occupied by a power plant facility equipped with tailings ponds, rail spurs, and electrical substations. Mr. Dave Raudio, ComEd Construction Specialist, confirmed that ComEd took over operations at the subject property in 1953.

City directories dated 1948 through 1968 list the subject property as occupied by the Public Service Company of Northern Illinois. City directories dated 1973 through 1993 list ComEd at the subject property address.

The 1924 and 1929 Sanborn Fire Insurance maps show the subject property as occupied by the Public Service Company of Northern Illinois (Power Plant #6). The main building and the majority of the outlying structures are located in the northeast portion of the property. The only outlying structures depicted south of the intake pond are rail spurs and conveyor systems.

The 1949 Sanborn Fire Insurance map shows the addition of three boilers in the main building and several storage and coal handling structures located east and south of the main building.

The 1969 Sanborn Fire Insurance map shows the addition of Units #6 through #8 and associated facilities in the main building. Several train car buildings, storage, and coal handling structures were also added to the east, west, and south portions of the subject property.

Based on a review of the Station's oil and hazardous material incident files, there have been several petroleum hydrocarbon spills on site. The majority of the spills did not impact soil and/or groundwater quality. Rather, they directly affected the cooling water intake and/or discharge canals.

2.5 Adjacent Site History

Historical information for the subject site vicinity is based on a review of aerial photographs, a topographic quadrangle map, city directories, Sanborn Fire Insurance maps, and interviews from site personnel and local government officials.

Currently, the subject property is bordered to the north by Greenwood Avenue, beyond which is the Johns Manville Company. The 1924, 1929, 1949, and 1969 Sanborn Fire Insurance maps also show the abutting property to the north as the Johns Manville Company. The 1939, 1959, 1964, 1975, 1985, 1990 and 1995 aerial photographs show the abutting properties to the north as the Johns Manville facility. A USGS topographic map dated 1960, photorevised in 1972 and 1980 shows the north abutting properties in their current configuration with the Manville plant, tailings ponds, and tailings storage piles. According to Mr. Raudio, the abutting properties to the north were developed during the early 1920s. City directories dated 1948 through 1954 did not contain a listing for the north abutting property. City directories dated 1959 through 1993 list the Johns Manville Product Corporation at the north abutting property address.

Currently, the subject property is bordered to the west by the station's main electrical switching yard, a wood chip staging/recycling area, and a construction material storage area owned by ComEd, beyond which is Pershing Road and Amstutz Expressway. The 1924, 1929, 1949, and 1969 Sanborn Fire Insurance maps show the abutting property to the west as the main station electrical switching yard, Greiss Pleger Tannery, and the U.S. Radiator Corporation of New Jersey. The 1939, 1959, 1964, 1975, 1985, 1990 and 1995 aerial photographs show the abutting properties to the west as developed with industrial type facilities. A USGS topographic map dated 1960, photorevised in 1972 and 1980 shows the west abutting properties to be developed with industrial type facilities, rail spurs, and electrical substations. According to Mr. Raudio, the abutting properties to the west were occupied by the main station electrical switching yard, a tannery, and radiator manufacturing facility since the 1920s. City directories dated 1948 through 1993 did not contain a listing for the west abutting properties.

Currently, the subject property is bordered to the south by the North Shore Sanitary District. The 1924, 1929, 1949, and 1969 Sanborn Fire Insurance maps show the abutting property to the south as the city of Waukegan Water Works. The 1939, 1959, 1964, 1975, 1985, 1990 and 1995 aerial photographs show the abutting properties to the south as developed with the North Shore Sanitary District facility. A USGS topographic map dated 1960, photorevised in 1972 and 1980 shows the south abutting properties to be developed with the aforementioned sewage treatment and disposal facility. According to Mr. Raudio, the abutting properties to the south have been occupied by city of Waukegan Water Works Department/North Shore Sanitation District since the 1920s. City directories dated 1948 through 1993 did not contain a listing for the south abutting properties.

2.6 Description of Operations

The subject property is a coal-fired electric power generating station. Additional operations include machinery and mechanical maintenance, wastewater treatment, and other plant maintenance operations. Electrical power is transmitted from the site to the area grid through overhead transmission power lines.

The generating station receives coal by rail south of the main building. Coal is transferred by a conveyor system from the coal dumper to the large coal storage area to the southeast. Coal is fed into active boilers associated with Units #6, #7 & #8 via conveyors through the breaker house on the south side of the main building.

Condenser cooling water is drawn from and returned to Lake Michigan at a rate of approximately 691 million gallons per day (MGD). Boiler make-up water is obtained from on-site ASTs storing demineralized Lake Michigan water. Water treatment chemicals, including ammonia, hydrazine, and sodium phosphate are added to the boiler make-up water lines to soften the water and inhibit corrosion and scaling. Sulfuric acid and sodium hydroxide are used to regenerate the demineralizer resins. Sodium hypochlorite is used to treat service water for biofouling control. No chemicals are added to condenser cooling water.

The burning of coal produces waste fly ash, bottom ash, and slag. Fly ash is collected in hoppers located east of the main building and is sold as construction material by Material Solutions, Inc. Bottom ash and slag are piped as slurry to the settling basins located south of the main building.

The cooling water intake and discharge canals are periodically dredged and the spoils (i.e. beach sand) are stock piled in a bermed area along the eastern boundary of the subject property. ComEd has dredging permits that stipulate the dredged sand be used by the State of Illinois as beach nourishment.

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Site-generated sanitary wastewater is piped off-site to the North Shore Sanitary District. Process wastewater from facility operations is treated on-site and stored in wastewater treatment basins. Wastewater basin effluent is discharged to Lake Michigan under the conditions of a NPDES permit. The NPDES permit covers discharges from the property including storm water runoff, cooling water, and any other process water.

The facility stores large quantities of the following materials: turbine oil, sulfuric acid, sodium hydroxide, lubricating oil, liquid nitrogen, ion exchange resin, diesel fuel, jet fuel, hydrazine, gasoline, fuel oil, fly ash, ethylene glycol, elemental sulfur, coal pile binder, coal pile surfactant, and carbon dioxide. Jet fuel is stored on-site in two 300,000-gallon ASTs. This fuel is used in eight jet engine peaker units and to ignite the three generating units. The fast start "peaker" system was installed in 1968 to meet heavy electrical demands during peak demand periods (i.e. summer).

2.7 Utilities

Currently, the Waukegan generating station obtains potable water from the city of Waukegan.

As previously indicated, the Waukegan generating station pipes sanitary wastewater off-site to the North Shore Sanitary District. Wastewater from facility operations is treated on-site and stored in wastewater treatment basins. Treated wastewater basin effluent is discharged to Lake Michigan under the conditions of a NPDES permit. The NPDES permit covers discharges from the property including storm water runoff, cooling water, and any other process water. The Northern Illinois Gas Company provides natural gas to the subject property. The Waukegan Station provides its own electrical power.

3.0 ENVIRONMENTAL DOCUMENT REVIEW

3.1 Introduction

This environmental document review is based upon an analysis of information provided by ComEd coupled with observations made by Jeffrey Menter and Aaron Gesin of ENSR during the site visit, which took place on August 31, 1998 and September 1, 1998. The information provided by ComEd included documents relative to the various regulatory areas described below.

3.2 Air Quality

Although no formal emissions inventory was prepared as part of this Phase I investigation, a preliminary review of the facility indicates air permits are required for the facility. The Illinois Environmental Protection Agency (IEPA) oversees the state's air permitting compliance programs. The facility currently has four operating permits from the IEPA. The air permits cover the operation of three boilers with electrostatic precipitators, turbine oil tanks, coal ash silos, fuel handling (coal) with a radial boom stacker and conveyor belt, ash handling, a fuel dispensing facility, and jet-fuel "peaker" units. This station has submitted a Title V permit application and is awaiting its approval.

3.3 Water Resources

The facility is permitted to discharge all treated wastewater, condenser cooling water, demineralizer regenerant wastes, boiler blowdown water, and storm water runoff to Lake Michigan under the provisions set forth in the NPDES permit issued August 9, 1995 expiring August 1, 2000. Storm water runoff from the main building area is directed towards numerous drains, catch basins, and/or sumps and discharged to the east and/or west wastewater basins. Storm water from the coal pile is directed toward and collected in the coal pile runoff basin. Storm water runoff from process areas of the station is treated in the existing wastewater treatment facility. Per the stations NPDES permit, this constitutes BAT for the treatment and discharge of storm water runoff, therefore the Waukegan Station is not required to maintain a Storm Water Pollution Prevention Plan (SWPP). The remaining storm water runoff from undeveloped areas of the subject property naturally percolates into the soil or runs off-site.

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3.4 Oil and Hazardous Material Storage and Use

3.4.1 Material Storage and Use

Several types of oils and hazardous materials are used on site. Several aboveground tanks, drums, and various types of containers located outdoors are used to store fuel oil, jet fuel, kerosene, hydraulic fluid, lubricating oil, antifreeze, and motor oil. Many of these containers were not equipped with secondary containment structures. However, surface run-off from these areas is directed toward the east and/or west wastewater basins, which is discharged under the provisions of the NPDES permit.

The facility has prepared contingency plans, including a Spill Prevention Countermeasure and Control Plan (SPCC) dated November 17, 1994, to prevent the discharge of oil from the aforementioned containers, and to mitigate any adverse effects from such a spill. An updated SPCC plan has been prepared and is under professional engineering review.

Based on interviews with facility personnel, and review of available information, no underground storage tanks are currently in use at the plant, however three USTs were retired in place and/or removed from the plant between 1986 and 1990 (see Section 4.2.1).

3.4.2 Principal Waste Streams

The facility generates several waste streams from its operation and maintenance activities, some of which are considered hazardous waste. The hazardous wastes may be generated on an intermittent or one-time basis. Regulatory database information identifies the ComEd Waukegan Station as a large quantity hazardous waste generator (ILD000803635). According to the ComEd Compliance Specialist, Ms. Jenni Cawein, the Waukegan Station generated hazardous waste in various forms, including used parts washer solvent prior to 1994. The Waukegan Station has used a non-hazardous parts cleaner supplied and disposed by Solvent Systems of Hampshire, Illinois from 1994 to present. Since 1994 when the station switched from a hazardous to non-hazardous parts cleaner, only minor amounts of hazardous waste are generated. Occasionally, ComEd generates medical waste, as result of personal injury accidents. When necessary, the medical wastes are disposed/treated off site by BFI of Waukegan, Illinois.

Non-hazardous wastes typically generated on site include general refuse, used hydraulic oil, used oil, used oil filters, oil soaked absorbents, slag, fly ash, antifreeze, boiler chemical cleaning waste, and boiler bottom ash. These wastes are stored in various types of containers, including dumpsters, drums, bins, silos, and basins. With exception of the waste oil, antifreeze, and boiler chemical cleaning waste; which the plant has a permit to burn in its boilers, the non-hazardous

wastes are disposed/reused off site using one of ComEd's approved vendors. A historic list of approved vendors and disposal sites are provided below.

Waste Transportation Vendors	Disposal Sites
SET Environmental - Wheeling, Illinois	Great Northern – Huntington, Indiana
BFI - Waukegan, Illinois	Great Northern – Huntington, Indiana
Solvent Systems – Hampshire, Illinois	Madison Prairie Landfill – Wisconsin
Solar Environmental – Gary, Indiana	Spring Grove Resource – Cincinnati, Ohio
ENSR Fleet Trucking – Columbus, Ohio	Forest Lawn Landfill - Three Oaks, MI
South Chicago Disposal – Chicago, Illinois	Treatment One – Houston, Texas
Waste Management, Cicero, Illinois	Madison Prairie Landfill - Wisconsin
Sun Ohio - Canton, Ohio	
Clean Harbors – Blue Island, Illinois	
United Scrap - Cicero, Illinois	

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4.0 ON-SITE CONTAMINATION POTENTIAL

4.1 Introduction

Based on ENSR's review of the facility there is a potential for on-site contamination at the ComEd Waukegan Station located in Waukegan, Illinois.

4.2 Above and Underground Storage Tanks

4.2.1 Inventory of Underground Tanks

According to Ms. Cawein, there are currently no active underground storage tanks (USTs) located on the subject property, however three USTs have either been removed and/or retired in place. Two 12,000-gallon ignition fuel USTs were installed in 1931 and retired in place in 1986. A 500-gallon gasoline UST was installed in 1931 and removed in 1990. An internal memorandum in ComEd's files indicates that soil samples were collected from the walls of the tank pit following the removal of the 500-gallon gasoline UST. The samples were analyzed for benzene, toluene, ethylbenzene, and xylene (BTEX). None of those compounds was detected in the soil samples. A 5,000-gallon oil/water separator was also apparently located at the subject property, but the date of installation was not available from ComEd, the Waukegan Fire Department, or the OSFM. No visual evidence of the UST (i.e., fill pipes) was observed during ENSR's site visit.

4.2.2 Inventory of Aboveground Storage Tanks

Table 4-1 provides a list of aboveground storage tanks identified at the Waukegan Station.

Table 4-1
Aboveground Storage Tanks
Waukegan Station

TANK TYPE	TANK LOCATION	ESTIMATED CAPACITY
Jet Fuel - Oil Tank	West of Jet Peaker Building	300,000 – gallons
Jet Fuel - Oil Tank	West of Jet Peaker Building	300,000 – gallons
Jet Fuel – Oil Additive	West of Jet Peaker Building	1,000 – gallons
Unit #5 – Turbine Oil	Basement of Unit #5	6,400 – gallons
Unit #6 – Turbine Oil	Basement of Unit #6	6,600 – gallons
#2 Diesel – Oil Tank	West of Coal Pile	10,000 – gallons

TANK TYPE	TANK LOCATION	ESTIMATED CAPACITY
#2 Diesel – Oil Tank	Tractor Repair Building	275 – gallons
#2 Diesel – Oil Tank	Machinery Shed	275 – gallons
#2 Diesel – Oil Tank	West of Locomotive House	500 – gallons
Oil Separator Tank	East Wastewater Basin	8,000 – gallons
Waste Oil Tank	East Wastewater Basin	7,500 – gallons
Oil Separator Tank	West Wastewater Basin	5,000 – gallons
Waste Oil Tank	West Wastewater Basin	7,500 – gallons
Waste Oil Tank	East of Main Building	10,000 – gallons
Gasoline Tank	West of Locomotive House	500 – gallons
Antifreeze Tank	Machinery Shed	275 – gallons
Antifreeze Tank	Machinery Shed	275 – gallons
Oil Tank	Machinery Shed	275 – gallons
Oil Tank	Machinery Shed	275 – gallons
Oil Tank	Machinery Shed	275 – gallons
Oil Tank	Machinery Shed	275 – gallons
Oil Tank	Machinery Shed	275 – gallons
Oil Tank	Machinery Shed	275 – gallons
Oil Tank	Machinery Shed	275 – gallons
Oil Tank	Machinery Shed	275 – gallons
Kerosene Tank	Southeast Corner of Main Building	500 – gallons
Gasoline Tank	Fire Brigade	250 – gallons
Surfactant Tank	Coal Pile Chemical Building	1,000 – gallons
Binder Tank	Coal Pile Chemical Building	7,500 – gallons
Suppressant Tank	Coal Pile Chemical Building	7,500 – gallons
Water Tank	Coal Pile Chemical Building	5,000 – gallons
Liquid Nitrogen	East of Main Building	1,500 – gallons
Sodium Hydroxide	Main Building	10,000 – gallons
Sulfuric Acid	Main Building	10,000 – gallons
Carbon Dioxide	Peaker Building	2,500 – gallons
Carbon Dioxide	Main Building	2,500 – gallons

Many of the ASTs and chemical storage areas were not equipped with secondary containment structures, and petroleum stains were observed on the concrete floors within the main building and several of the outlying structures. Petroleum stains were also observed on exterior paved, gravel, and soil covered surfaces adjacent to the main building and outlying structures. However, surface run-off from these areas is directed toward the east and/or west wastewater basins, which is discharged under the provisions of the NPDES permit. A listing of these stained areas is provided in Section 4.5.

4.3 Polychlorinated Biphenyls (PCBs)

There are numerous liquid-cooled transformers on the site. According to Mr. Dave Rubner, ComEd PCB Specialist, a fluid exchange process to remove PCB containing dielectric fluid from transformers at all of the ComEd stations was conducted during the 1980s. Since the completion of the fluid exchange process, all transformers at the Waukegan Station are currently PCB free (i.e. below 50 ppm) and are considered to have extremely low potential for leachback to levels in excess of 50 ppm. Based on these statistics, ComEd does not intend to perform any additional testing of the transformers at the Waukegan Station.

However, ENSR observed evidence of mislabeling (i.e. multiple labels on a single transformer listing different PCB concentrations) and oil staining around many of the pad-mounted electrical transformers located along the east and west sides of the main building. Although no permitting requirements currently apply to the use of equipment containing or potentially containing PCB coolants, equipment containing more than 50 ppm PCBs must be marked with the appropriate warning labels (40 CFR 761.45, PCB).

4.4 Asbestos-Containing Materials

ENSR representatives who are State of Illinois Department of Public Health licensed Asbestos Building Inspectors performed a visual suspect asbestos-containing material (ACM) inspection of the main building and outlying structures as part of this investigation, however, bulk sampling was not performed. The types and quantities of suspect materials identified during the meticulous walk-through of each on-site structure at the Waukegan Station included pipe and pipe fitting insulation, boiler and equipment insulation, tank insulation, pump insulation, vinyl floor tile, suspended ceiling tile, and spray-on insulation. Although the removal of all ACM is not required at this time, Table 4-3 presents the types and estimated quantities of suspect ACM, as well as estimated removal costs.

Table 4-3
Asbestos-Containing Materials
Waukegan Station

[illegible]	[illegible]	[illegible]
Pipe & Pipe Fitting Insulation	1,205,000 Linear Feet	$2,410,000
Boiler & Equipment Insulation	212,000 Square Feet	$5,300,000
Tank & Pump Insulation	6,500 Square Feet	$162, 500
Vinyl Floor Tile	2,000 Square Feet	$10,000
Suspended Ceiling Tile	3,000 Square Feet	$30,000

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[illegible]	[illegible]	[illegible]
Spray-on Insulation	50,000 Square Feet	$1,250,000

The total suspect ACM removal cost is estimated at $9.2 million. The cost estimate is based on ACM location and quantity information provided by ComEd, ENSR's visual inspection of accessible areas of the facility, and generally accepted ACM removal unit costs. The cost estimate does not include project consulting or reinsulation fees. The estimated removal cost provided above is subject to change as a result of the potential variability in material quantities and locations, contractor fees, disposal fees, and project scheduling. Based on the aforementioned variables, the removal costs may fluctuate as much as 50%.

An additional asbestos issue was also identified at the Waukegan Station during ENSR's investigation. Asbestos in the form of transite brake shoes was observed in the dredge spoils and along the lakefront of the subject property. According to ComEd personnel, the Waukegan Station has not manufactured asbestos products and the presence of the transite brake shoes is likely from an off-site source. Estimated quantities and removal costs associated with the cleanup of the transite could not be provided at this time.

4.5 Areas of Surface Staining

The ENSR site inspection was conducted between August 31, 1998 and September 1, 1998. In general, housekeeping conditions at the subject facility were good, with individual areas requiring more attention than others. The following areas of surface staining were identified during the environmental investigation of the subject property:

- Petroleum stains were observed on the concrete floor in the indoor oil storage area. The oil storage room serves as secondary containment with a raised berm protecting the doorway.
- Petroleum stains were observed on the concrete floor within the machinery storage shed and also on the ground surface adjacent to the exterior of the shed.
- Petroleum stains were noted on the ground surface adjacent to the east and west basin oil/water separators and oil storage tanks.
- Petroleum stains were noted on the gravel parking lot surface adjacent to the waste oil AST and wastewater pump system located east of the main building.
- Petroleum surface staining and areas of distressed vegetation were observed east of the Butlers buildings in the old fire brigade training area of the subject property.

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- Petroleum surface staining was observed on the ground surface adjacent to several of the pad-mounted transformers located to the east and west of the main building.

- Petroleum surface staining was observed on the ground surface adjacent to the ignition fuel pump house.

- Petroleum surface staining was observed on the ground surface beneath the 10,000-gallon diesel AST located south of the main building.

4.6 On-Site Wastewater System

Building and assessment records indicate the subject property has been occupied by a coal fired power plant facility from approximately 1923 until the present. In July 1977, ComEd was issued IEPA Permit #1977-EB-3699 for the construction of miscellaneous wastewater treatment facilities including clay-lined wastewater treatment settling basins, a synthetically lined coal pile drainage basin, and a synthetically-lined fly/bottom ash settling basin system. Prior to this time, unlined slag basins were in use at the station. It is unknown if the historic use of unlined basins has had an impact on the subsurface at the subject property.

4.7 Railroad

A railroad has abutted and been located on the subject property since at least 1923 according to aerial photographs, Sanborn Fire Insurance maps, and interviews with site personnel. It is unknown if the presence of the railroad and rail spur has had an impact on the subject property from fuels, oils, and/or solvents. ENSR observed areas of pervasive staining along the railroad tracks near the train car "thaw" house, "drive house", and "dump" house.

4.8 Spill History

As previously indicated, there have been several petroleum hydrocarbon spills on site, based on a review of the Station's oil and hazardous material incident files and Spill Prevention Control and Countermeasures Plan. The majority of the spills did not impact soil and/or groundwater quality. Rather, they discharged directly to the cooling water intake and/or discharge canals. A summary of the spill/release incidents at Waukegan Station is provided below.

Waukegan Station's NPDES permit file contained several incident reports relating to spills that occurred on site between 1978 and 1997, and that resulted in a condition that was either in violation of their NPDES (cooling water discharge) permit or that required notification to emergency response agencies (e.g., the Coast Guard). In all cases, the incidents involved

petroleum hydrocarbons that leaked from the Station's equipment directly or indirectly (e.g., through a discharge pipe) to the cooling water canals. Based on the descriptions of the cleanup actions taken by ComEd in response to the incidents, it does not appear as though soil and/or groundwater quality was impacted by these spills/releases. We note that several of the spills were caused by leaks from the plant's oil coolers, including a large spill (600 gallons) that occurred in 1993.

The only record of a spill/release that impacted soil quality on site was the release of jet fuel that occurred during the early 1990s. According to Ms. Jenni Cawein, the release was caused from a leak in an underground pipe associated with the large aboveground storage tank. Ms. Cawein also indicated that the release was not required to be reported to the Illinois Emergency Management Agency (IEMA) and groundwater was not sampled to determine whether that media had been impacted. However, approximately 500 to 1,000 cubic yards of contaminated soil were excavated from the impacted area and treated on-site. The area served as a bioremediation project site during the spring and summer of 1994. Both *in situ* and *ex situ* treatments were conducted over an approximately 6-8-month time period. Sample results indicated a 50-90 percent reduction in total petroleum hydrocarbons (TPH) concentrations in the areas impacted by the leak.

4.9 Adjacent Property

According to Sanborn Fire Insurance maps, aerial photographs, and interviews with site personnel, the north adjacent property has been occupied by an asbestos manufacturing company since the 1920s. The west adjacent properties have been occupied since the 1920s by the Waukegan Station's main electrical switch yard, as well as a tannery and radiator manufacturing facility. According to ComEd documentation, there has been PCB-containing fluid releases from transformers and capacitors, as well as, releases from underground storage tanks containing petroleum products. Furthermore, the tannery and radiator facilities are no longer in operation, but also have left behind soil and groundwater contamination. An arsenic, lead, mercury, and chromium contaminated groundwater plume has been identified on the former tannery site, which extends easterly onto the subject property. The former radiator manufacturing facility has also left behind petroleum-contaminated soil and groundwater from leaking underground storage tanks, which may also be affecting the subject property.

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4.10 Environmental Database Review

ENSR reviewed a variety of federal and state governmental databases using Environmental Data Resources (EDR) of Southport, Connecticut. The following federal and state contamination-related databases were searched for the subject property and surrounding area; the various search distances used are also noted:

TABLE 4-4
Databases Searched and Radii

Database Acronym	Description	Search Distance[1] (miles)
Federal Databases		
NPL[2]	Existing and proposed Superfund sites on the National Priorities List	1.0
CERCLIS[2]	Abandoned, uncontrolled or inactive hazardous waste sites reported to the U.S. EPA, which have been or are scheduled to be investigated by the U.S. EPA for potential nomination to the NPL.	0.5
RCRIS-TSD[2]	Reported sites that treat, store and/or dispose of hazardous waste and subject to the federal RCRA regulations.	0.5
RCRIS-LQG/SQG[2]	Reported large-quantity generators and small quantity generators of hazardous waste.	0.25
ERNS[2]	Sites reporting spills to the U.S. EPA and/or the U.S. Coast Guard under various federal regulations	Target property
FINDS	Facility Index System indicates the presence of a site on another federal database.	Target property
PADS	PCB Activity Database System identifies generators, transporters, commercial storers and/or brokers and disposers of PCBs who are required and have notified the EPA of such activities.	Target property
RAATS	RCRA Administrative Tracking System contains records based on enforcement actions issued under RCRA pertaining to major violators and includes administrative and civil actions brought by the EPA.	Target property
TRIS	Toxic Chemical Release Inventory System identified facilities who have reported releases of listed toxic chemicals to the air, water, and land in reportable quantities under SARA Title III Section 313.	Target property

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TABLE 4-4
Databases Searched and Radii

Database Acronym	Description	Search Distance[1] (miles)
TSCA	Toxic Substances Control Act identified manufacturers and importers of chemical substances by plant site in 1986. No updates of the list have been made by EPA.	Target property
HMIRS	Hazardous Materials Information Reporting System contains hazardous material spill incidents reported to the Federal DOT.	Target property
NPL Liens	List of liens placed against real property in order for the EPA to recover remedial action expenditures or when the property owner receives notification of potential liability.	Target property
CORRACTS	Corrective Action Report identifies hazardous waste handlers with RCRA corrective action activity.	1.0
ROD	Records of Decision mandating a permanent remedy for a Superfund Site	1.0
MLTS	Material Licensing Tracking System, maintained by the Nuclear Regulatory Commission, contains a list of sites that possess or use radioactive materials and are subject to NRC licensing.	Target property
Delisted NPL	Sites removed from the NPL	Target property
Coal Gas	Former manufactured coal gas sites	1.0
Illinois Databases		
SWHS[2]	State hazardous waste sites	1.0
UST[2]	Sites which have reported underground storage tanks.	0.5
LUST[2]	Sites which have reported leaking underground storage tanks.	0.5
SWF/LF[2]	List of permitted solid waste disposal facilities	0.5

1 The radial search distances used equal or exceed those recommended by ASTM for assessing the environmental condition of commercial real estate.
2 Databases which are required to be searched by ASTM.

4.10.1 Subject Property

The subject property was listed on the following databases: FINDS, ERNS, RCRIS-LQG, and LUST. The federal FINDS database only indicates the facility's presence on other databases and

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the ERNS indicate that the facility had a release of oil and/or hazardous substances on the subject property.

The RCRIS-LQG database indicates the facility is a large quantity generator of hazardous waste and is identified with IEPA #ILD000803635. However, ENSR reviewed an internal letter of comments attached to the 1993 Hazardous Waste Generation Report submitted to the IEPA dated February 25, 1994. This letter stated a new program was initiated to replace hazardous waste generating solvent in parts washing units with a non-hazardous type. As a result of successful waste minimization efforts, the IEPA was notified updating the Waukegan Station's generator status from hazardous to non-hazardous. Contact with the ComEd Compliance Specialist, Ms. Cawein, also indicated the Waukegan Station generated hazardous waste in the form of used parts washer solvent prior to 1994. Since 1994, the Waukegan Station only uses non-hazardous parts cleaner supplied and disposed of by Solvent Systems of Hampshire, Illinois.

The LUST database indicates the facility reported a petroleum release from an underground storage tank (IEPA LUST Incident #901211). According to Mr. Steve Jones, Environmental Protection Specialist with the IEPA Leaking Underground Storage Tank Division, the incident was identified on May 4, 1990 and remains an open case. However, ENSR reviewed a letter to the IEPA from ComEd dated May 22, 1990, which stated that a release from an underground storage tank was not the case, rather, it was an oil release from piping connected to a turbine oil reservoir. The reservoir, which is located entirely within the main building, ruptured an oil line releasing oil into a basement floor drain. The floor drain is routed to a sump that empties into the discharge flume. The release of oil resulted in an NPDES non-compliance violation.

4.10.2 Surrounding Land Uses

According to the EDR database report, several sites were identified within the specified search radius and are summarized in Table 4-2.

TABLE 4-2
EDR Database Summary

Site	Database	Distance	Direction	Location Relative to Inferred Hydraulic Gradient at Site
ComEd (Former Greiss Pfleger Tannery 1251 Sand Street Waukegan, Illinois	CERCLIS, FINDS, RCRIS-LQG	Adjacent	West	Upgradient

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TABLE 4-2

EDR Database Summary

Site	Database	Distance	Direction	Location Relative to Inferred Hydraulic Gradient at Site
Manville Sales Corporation Greenwood Avenue & Sand Street Waukegan, Illinois	CERCLIS, RCRIS-SQG, FINDS, NPL, TRIS, SHWS	Adjacent	North	Cross-gradient
Thermal Ceramics, Inc. 120 E. Greenwood Avenue Waukegan, Illinois	FINDS, RCRIS-SQG	1/8-1/4 mile	Northwest	Upgradient
Waukegan Tar Pits JCT of Pershing & Dehringer Road Waukegan, Illinois	CERCLIS, FINDS, SHWS, RCRIS-LQG	1/2-1 mile	Southwest	Cross-gradient
Outboard Marine Corporation 200 Seahorse Drive Waukegan, Illinois	CERCLIS, FINDS, NPL, RCRIS-LQG, TRIS, RCRIS-TSD, CORRACTS, CONSENT, ROD, LUST	1/2–1 mile	South	Cross-gradient
North Shore Gas Company Sand & Dehringer Road Waukegan, Illinois	Coal Gas	1/2–1 mile	Southwest	Cross-gradient

The inferred groundwater flow direction in the subject property vicinity is toward Lake Michigan, which is located adjacent to the east of the subject property. Based on distance, inferred hydraulic gradient, and/or regulatory status, the last four above listed sites are unlikely to impact the subject property. However, as indicated in Section 4.9, the first two listed sites, Manville Sales Corporation and the former Pfleger Tannery have impacted the subject property, and are further discussed below.

- ComEd (Former Greiss Pfleger Tannery), located at 1251 Sand Street in Waukegan, Illinois is listed on the CERCLIS, FINDS, and RCRIS-LQG databases. The site is located adjacent west of the subject property. According to the EDR database report, the site is not listed on the NPL. However, interviews with ComEd personnel revealed that soil and groundwater contamination is prevalent at this location, which extends onto the subject property.

- Manville Sales Corporation, located at Greenwood Avenue and Sand Street in Waukegan, Illinois is listed on the CERCLIS, RCRIS-SQG, FINDS, NPL, TRIS, and SHWS databases. The site is located approximately less than 1/8 mile north of the subject property. According to

the EDR database report, the site has been issued compliance violations, is listed on the final NPL, and is identified as an asbestos disposal facility. According to ComEd personnel, the Waukegan Station has not manufactured asbestos products, however the presence of the transite has been identified in the dredge spoils and believes these materials are from an off-site source. No closure date is reported on the EDR report. Based on the above information, this site is likely to have impacted the subject property.

5.0 SUMMARY OF FINDINGS

ENSR performed a Phase I Environmental Assessment in conformance with the scope and limitations of the ASTM practice E-1527-97 at the Commonwealth Edison Waukegan Station located at 10 Greenwood Avenue, Waukegan, Illinois. Any exceptions to or deletions from this practice are described in this report. This practice has revealed evidence of the following recognized environmental conditions associated with the subject property:

- Underground Storage Tanks: According to Mr. Dave Raudio, Construction Specialist, and available information, the facility has removed and/or abandoned-in-place three USTs used to store ignition oil and gasoline. According to Ms. Cawein, there are currently no active USTs located on the subject property. Two 12,000-gallon ignition fuel USTs were installed in 1931 and retired in place in 1986. A 500-gallon gasoline UST was installed in 1931 and removed in 1990. An internal memorandum in ComEd's files indicates that soil samples were collected from the walls of the tank pit following the removal of the 500-gallon gasoline UST. The samples were analyzed for benzene, toluene, ethylbenzene, and xylene (BTEX). None of those compounds was detected in the soil samples. A 5,000-gallon oil/water separator is also located at the subject property, but the dates of installation was unable to be provided by ComEd personnel, Waukegan Fire Department, or the OSFM. Although, no visual evidence (i.e., fill pipes) were observed during the ENSR site visit, no analytical results or clean closure documents were available for review. It is unknown if subsurface petroleum contamination exists.

- Aboveground Storage Tanks: Many of the ASTs and chemical storage areas were not equipped with secondary containment structures and petroleum staining was observed on the concrete floors within the main building and several of the outlying structures. Areas of petroleum staining were also observed on exterior paved, gravel, and soil covered surfaces adjacent to the main building and outlying structures. However, surface run-off from these areas is directed toward the east and/or west wastewater basins, which is discharged under the provisions of the NPDES permit.

- Polychorinated Biphenyls (PCBs): There are numerous liquid-cooled transformers on the site. According to Mr. Dave Rubner, ComEd PCB Specialist, a fluid exchange process to remove PCB containing dielectric fluid from transformers at all of the ComEd stations was conducted during the 1980s. Since the completion of the fluid exchange process, all transformers at the Waukegan Station are currently PCB free (i.e. below 50 ppm) and are considered to have extremely low potential for leachback to levels in excess of 50 ppm. Based on these statistics, ComEd does not intend to perform any additional

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testing of the transformers at the Waukegan Station. However, ENSR observed evidence of mislabeling (i.e. multiple labels on a single transformer listing different PCB concentrations) and oil staining around many of the pad-mounted electrical transformers located along the east and west sides of the main building. Although no permitting requirements currently apply to the use of equipment containing or potentially containing PCB coolants, equipment containing more than 50 ppm PCBs must be marked with the appropriate warning labels (40 CFR 761.45, PCB).

- Asbestos: According to Mr. Raudio, the spray-on material located on and within the train car "thaw" house has been tested and found to contain asbestos. This material, as well as, pipe insulation, boiler insulation, floor tile, ceiling tile, and any other materials not identified as asbestos free, should be treated as ACM. An additional asbestos issue was also identified at the Waukegan Station during ENSR's investigation. Asbestos in the form of transite brake shoes was observed in the dredge spoils and along the lakefront of the subject property. According to ComEd personnel, the Waukegan Station has not manufactured asbestos products and the presence of the transite brake shoes is likely from an off-site source. Estimated quantities and removal costs associated with the cleanup of the transite could not be provided at this time.

- Areas of Petroleum Surface Staining: Several areas of surface staining were observed on interior concrete and on exterior paved, gravel, and soil covered areas. Many of the aboveground storage tanks, transformers, and chemical storage areas were not equipped with secondary containment structures and petroleum staining was observed adjacent to these areas. However, surface run-off from these areas is directed toward the east and/or west wastewater basins, which is discharged under the provisions of the NPDES permit.

- On-Site Wastewater and Fly/Bottom Ash Disposal Systems: Building and assessment records indicate the subject property has been occupied by a coal fired power plant facility from approximately 1923 until the present. In July 1977, ComEd was issued IEPA Permit #1977-EB-3699 for the construction of miscellaneous wastewater treatment facilities including clay-lined wastewater treatment settling basins, a synthetically lined coal pile drainage basin, and a synthetically-lined fly/bottom ash settling basin system. Prior to this time, unlined slag basins were in use at the station. It is unknown if the use of the unlined basins may have impacted the subsurface at the subject property.

- Railroad: A railroad has abutted and been located on the subject property since at least 1923. The presence of the railroad and rail spur may have had an impact on the subject property from fuels, oils, and/or solvents. ENSR observed areas of pervasive staining

along the railroad tracks near the train car "thaw" house, "drive house", and "dump" house.

- On-Site Spills/Releases: Based on a review of Waukegan Station's incident files, there have been several spills/releases on site. However, only one appears to have adversely affected on-site soil quality. According to Ms. Jenni Cawein, the release was caused from a leak in an underground pipe associated with the large aboveground storage tank. Ms. Cawein also indicated that the release was not required to be reported to the Illinois Emergency Management Agency (IEMA) and groundwater was not sampled to determine whether that media had been impacted. However, approximately 500 to 1,000 cubic yards of contaminated soil were excavated from the impacted area and treated on-site. The area served as a bioremediation project site during the spring and summer of 1994. Both *in situ* and ex *situ* treatments were conducted over an approximately 6-8-month time period. Sample results indicated a 50-90 percent reduction in total petroleum hydrocarbons (TPH) concentrations in the areas impacted by the leak.

- Adjacent Properties: The north adjacent property has been occupied by an asbestos manufacturing company since the 1920s. The west adjacent properties have been occupied since the 1920s by the Waukegan Station's main electrical switch yard, as well as a tannery and radiator manufacturing facility. According to ComEd documentation, there has been PCB-containing fluid releases from transformers and capacitors, as well as, releases from underground storage tanks containing petroleum products. Furthermore, the tannery and radiator facilities are no longer in operation, but also have left behind soil and groundwater contamination. An arsenic, lead, mercury, and chromium contaminated groundwater plume has been identified on the former tannery site, which extends easterly onto the subject property. The former radiator manufacturing facility has also left behind petroleum-contaminated soil and groundwater from leaking underground storage tanks, which may also be affecting the subject property.

MWG13-15_12035

6.0 REFERENCES

6.1 Persons Interviewed or Contacted

Mr. Dave Raudio, Construction Specialist, Commonwealth Edison, 10 Greenwood Avenue, Waukegan, Illinois; (847) 662-6201.

Ms. Jenni Cawein, Compliance Specialist, Commonwealth Edison, 10 Greenwood Avenue, Waukegan, Illinois; (847) 662-6201.

Mr. Christopher Lux, Site Construction Specialist, Commonwealth Edison, 10 Greenwood Avenue, Waukegan, Illinois; (847) 662-6201.

Mr. Dave Rubner, PCB Specialist, Commonwealth Edison, 10 South Dearborn Street, Chicago, Illinois; (312) 394-4461.

Mr. Steve Jones, Environmental Protection Specialist, Illinois Environmental Protection Agency Leaking Underground Storage Tank Division, Springfield, Illinois; (217) 782-6762.

6.2 Documents and Reports Reviewed

City of Waukegan Building Department Records, 18 North County Street, Waukegan, Illinois.

City of Waukegan Assessment Department Records, 18 North County Street, Waukegan, Illinois.

Aerial Photographs of subject property and surrounding properties dated 1939, 1959, 1964, 1975, 1985, 1990, and 1995 reviewed the City of Waukegan Graphics Department, 18 North County Street, Waukegan, Illinois.

Polk's 1948 through 1993 City Directories reviewed at the City of Waukegan Public Library, 128 North County Street, Waukegan, Illinois.

Ecology and Environment, Inc. of Chicago, Illinois, Screening Site Inspection Report , prepared for Pfleger Greiss, Waukegan, Illinois, dated March 13, 1990.

NPDES Permit #IL0002259, issued August 9, 1995, expiration August 1, 2000.

Illinois Generator Non-Hazardous Special Waste Report dated January 1, 1996.

Illinois Generator Non-Hazardous Special Waste Report dated January 1, 1997.

Illinois Generator Non-Hazardous Special Waste Report dated January 1, 1998.

Spill Prevention and Countermeasures Plan (SPCC) for Waukegan Generating Station, dated November 11, 1994.

Metcalf & Eddy of Chicago, Illinois, Report of Outstanding Environmental Liabilities at The Winston Property, 184 Dahringer Road, Waukegan, Illinois, dated May 18, 1998.

LUST Correspondence Letter between Comed and IEPA, dated May 22, 1990, regarding the misrepresentation of an oil spill as a LUST incident.

EDR Radius Map with Geocheck®, Comed Waukegan Station, 10 Greenwood Avenue, Waukegan, Illinois, dated August 18, 1998.

EDR Sanborm™ Map Report, ComEd Waukegan Station, 10 Greenwood Avenue, Waukegan, Illinois, dated August 18, 1998.

U.S.G.S. 7.5-minute Topographical Quadrangle Map, Zion, Illinois, dated 1960, photorevised 1972 and 1980.

Letter from Commonwealth Edison to the Waukegan Fire Marshal, dated February 26, 1998, regarding 1997 Tier II Emergency and Hazardous Chemical Inventory Form for Commonwealth Edison Waukegan Station, 10 Greenwood Avenue, Waukegan, Illinois.

7.0 SIGNATURES AND QUALITY CONTROL REVIEW

BY: _____
Jeffrey D. Menter

TITLE: Senior Staff Specialist

DATE: 10/5/98

QUALITY CONTROL REVIEW

BY: _____
Aaron Gesin

TITLE: Program Manager

DATE: 10/5/98

7.0 SIGNATURES AND QUALITY CONTROL REVIEW

BY: _____
Jeffrey D. Menter

TITLE: Senior Staff Specialist

DATE: 10/2/98

QUALITY CONTROL REVIEW

BY: _____
Aaron Gesin

TITLE: Program Manager

DATE: 10/2/98

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Exhibit

45

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HISTORY OF CONSTRUCTION
EAST AND WEST ASH BASINS
WAUKEGAN STATION
OCTOBER 2016

Geosyntec Consultants (Geosyntec) prepared this history of construction report for the East and West Ash Basins located at the Waukegan Station (Site) in Waukegan, Illinois, which is owned and operated by Midwest Generation, LLC (Midwest Generation). This history of construction report addresses the requirements of the Coal Combustion Residuals (CCR) Rule codified in the Code of Federal Regulations Title 40, Part 257, Subpart D. These regulations were published in the Federal Register on 17 April 2015 and became effective on 19 October 2015. This report identifies and addresses the specific requirements of §257.73(c) of the CCR Rule regarding preparing a history of construction report for CCR surface impoundments. Specifically, this report provides the history of construction through 17 October 2016 for the East and West Ash Basins.

This report was prepared under the direction of Ms. Jane Soule, P.E., and was reviewed in accordance with Geosyntec's internal review policy by Mr. Robert White of Geosyntec.

1. CCR Rule Requirements for History of Construction

History of construction requirements for existing CCR surface impoundments are included in the structural integrity criteria presented in §257.73 of the CCR Rule. The preamble of the CCR Rule (Page 21380) states that the history of construction for an existing CCR impoundment (in this case, the East and West Ash Basins) is required to include information only to the extent available and that only factual documentation, not anecdotal or speculative information, is to be included. Additionally, the preamble states that no new information should be generated to satisfy the requirements of §257.73(c).

2. History of Construction

2.1 Owner and Unit Identification - §257.73 (c)(1)(i)

Owner and unit identification for the East and West Ash Basins are presented in Table 1 below.

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Table 1: Owner and Unit Identification

UNIT NAME	OWNER/OPERATOR	IDENTIFICATION NUMBER
East Ash Basin	Midwest Generation 804 Carnegie Center Princeton, NJ 08540	IL0002259
West Ash Basin	Midwest Generation 804 Carnegie Center Princeton, NJ 08540	IL0002259

2.2 Unit Location on USGS Map – §257.73 (c)(1)(ii)

The Site is located west of Lake Michigan in Waukegan, Illinois. Figure 1 presents the location of the East and West Ash Basins on a 7.5-minute United States Geological Survey (USGS) topographic quadrangle map.

2.3 Purpose of the CCR Units – §257.73 (c)(1)(iii)

The East and West Ash Basins serve as settling ponds for sluiced CCR and other process waters related to electrical power generation at the Site.

2.4 Name and Size of the Watershed – §257.73 (c)(1)(iv)

The East and West Ash Basins are located in the Waukegan River – Frontal Lake Michigan watershed (HUC12 040400020501), which is approximately 31,245 acres in size (USGS, 2015). However, surface water run-on to the Basins is limited to the area within the embankment crests because the basins are constructed with elevated embankments or run-on diversion berms surrounding them.

2.5 Description of Foundation– §257.73 (c)(1)(v)

The East and West Ash Basins consist of fill embankments on all sides. Because no formational materials provide lateral structural support for the embankments, the basins do not contain abutments. The area west of the West Ash Basin is at approximately the same elevation as the west embankment crest, such that there is not a downstream slope of the west embankment. A divider berm separates the two basins and acts as the west embankment for the East Ash Basin and the east embankment for the West Ash Basin. The remainder of this section addresses the foundation materials for the basins' embankments.

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2.5.1 Physical Properties of Foundation Materials

Information on the physical properties of the foundation materials for the East and West Ash Basins is based on published geologic information and field investigations performed at the Site by KPRG in 2005 and 2015, Patrick Engineering in 2011, and Geosyntec in 2015. Detailed descriptions of these investigations and the regional geology at the Site are included in the Geosyntec (2016a).

The East and West Ash Basins are directly underlain by the Henry Formation which generally consists of approximately 30 feet of dense poorly graded sand with some gravel and silt and silty sand. The Henry Formation is underlain by the Wadsworth Formation which consists of very hard low plasticity clay in the vicinity of the Site.

2.5.2 Engineering Properties of Foundation

Table 2 presents engineering properties for the foundation materials at the Site developed for the safety factor assessment (Geosyntec, 2016a). These engineering properties are based on previous investigations performed at the Site, published correlations, and laboratory testing of samples collected from foundation soils during the Site investigations. Based on the observed very hard consistency of the Wadsworth Formation and its depth below the base of the embankments, the material is not considered in the safety factor assessment and engineering properties were not developed.

Table 2: Foundation Material Engineering Properties

MATERIAL	UNIT WEIGHT (PCF)	DRAINED FRICTION ANGLE (DEGREES)	EFFECTIVE COHESION (PSF)
Henry Formation	125	37	0

2.6 Description of the Materials, Methods, and Dates of Construction - §257.73 (c)(1)(vi)

The following sections describe the type, size, range, and physical and engineering properties of the materials used in constructing each zone or stage of the East and West Ash Basins, the method of site preparation and construction of each zone of the unit, and the approximate dates of construction of each successive stage of construction of the unit, to the extent the information is available.

Information presented in the following sections is based on available construction drawings (NUS, 1977 and 1978) and subsequent investigations at the Site. No as-built construction

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drawings or construction completion reports detailing the actual materials and methods used for the construction of the basins were available for this report.

Based on the available construction drawings (NUS, 1977), dikes existed in the area of the East and West Ash Basins prior to their construction. Cross sections show areas where existing dikes were widened and raised during construction with compacted fill. Surface impoundment embankments were designed with typical crest widths ranging from 12 to 16 feet. Additional earthen structures overlay the downstream embankment slope to provide for auxiliary uses such as vehicular traffic and pipe support. These additional earthen structures are not required for structural support of the impoundment. The construction drawings indicate that compacted fill for dikes was required to be placed at 95% relative compaction and that the existing foundation areas should be stripped of unsuitable materials (NUS, 1977).

Interior slopes were designed at an inclination of 2H:1V (horizontal:vertical) and exterior slopes were designed at 2H:1V or flatter (NUS, 1977). The interior slopes and basin floor were originally lined with a geomembrane (Hypalon) liner. According to site personnel, in 2003 (East Ash Basin) and 2005 (West Ash Basin), the Hypalon liner was removed and replaced with the existing 60-mil smooth high-density polyethylene (HDPE) geomembrane liner. During this construction process, the interior slopes of the basins were flattened to 2.5H:1V (Midwest Generation, 2002). Based on 2015 aerial topography, existing exterior (or downstream) slopes range from approximately 1.4H:1V to 3H:1V or flatter (GeoTerra, 2015). Exterior slopes along the eastern and southeastern side of the East Ash Basin were flattened to 2H:1V in 2016.

2.6.1 Engineering Properties

Engineering properties used for the design and construction of the East and West Ash Basins were not available at the time of this report. However, engineering properties were estimated for use in the factor of safety assessment performed for the basins in accordance with the CCR Rule. The estimated engineering properties were based on investigations performed at the Site, published correlations, and laboratory testing of embankment materials and are presented in Geosyntec (2016a) and reproduced in Table 3. For engineering analyses, the embankments were divided into two different materials: Upper Fill located from the embankment surface to approximately 10 to 12 feet below the top of the embankment along its centerline and Lower Fill from the bottom of the Upper Fill to the foundation material.

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Table 3: Embankment Fill Engineering Properties

MATERIAL	UNIT WEIGHT (PCF)	DRAINED FRICTION ANGLE (DEGREES)	EFFECTIVE COHESION (PSF)
Upper Fill	125	37	25
Lower Fill	115	32	25

2.6.2 Construction Dates

Construction dates for the East and West Ash Basin embankments, original liner system, and appurtenant structures are unknown; however, construction drawings were approved for construction in August 1977 (NUS, 1977). Replacement of the original liner systems were completed in 2003 and 2005 for the East and West Ash Basins, respectively. Modification of the eastern and southeastern slopes of the East Ash Basin was completed in September 2016.

2.7 Drawings - §257.73 (c)(1)(vii)

Available drawings relevant to the design, construction, operation, and maintenance of the East and West Ash Basin are included in Appendix A. Appendix A-1 includes construction drawings[1] (NUS, 1977 and 1978), Appendix A-2 includes a drawing from the liner replacement performed in 2003 (Midwest Generation, 2002) and Appendix A-3 includes construction drawings from the eastern and southeastern slope modifications completed in 2016 (Geosyntec, 2016b).

2.8 Instrumentation - §257.73 (c)(1)(viii)

Water level monitoring instrumentation was installed along the outboard (basin) side of the concrete weir walls within both the East and West Ash Basins in October 2016. This instrumentation includes ultrasonic level detectors with automated remote sensors that provide notification to station operators of basin water level conditions (high level, low level or no signal).

2.9 Area-Capacity Curve - §257.73 (c)(1)(ix)

Area-capacity curves for the East and West Ash Basins are included as Figure 2.

[1] The available construction drawings (NUS, 1977 and 1978) are based on a site specific vertical datum. Slope modification drawings (Geosyntec 2016) are based on the North American Vertical Datum of 1988 (NAVD88). The 1977 and 1978 construction drawings referred to the West Ash Basin as Pond I and the East Ash Basin as Pond II.

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2.10 Spillway Description and Calculations - §257.73 (c)(1)(x)

The East and West Ash Basins do not contain spillways.

2.11 Construction Specifications and Provisions for Surveillance, Maintenance and Repair - §257.73 (c)(1)(xi)

Earthwork, HDPE geomembrane, and specifications from requests for proposals solicited by Midwest Generation for the liner replacement projects constructed in 2003 and 2005, for the East and West Ash Basins, respectively, are included in Appendix B-1 and B-2. Technical specifications for the 2016 slope modification project for the East Ash Basin, including specifications for earthwork and geosynthetics (Geosyntec, 2016c), are included in Appendix B-3.

As part of the 2003 and 2005 liner replacement projects, warning posts were installed at the toe of interior basin slopes above the geomembrane liner system. These posts are utilized as a visual guide to identify the toe of slope during CCR removal operations to limit potential damage to the liner system.

2.12 Record of Any Structural Instability - §257.73 (c)(1)(xii)

Midwest Generation retained Raymond Professional Group, Inc. (RPG) to prepare a Report of Engineering Study to propose repairs to instability observed in the interior embankments of the basins in January 2002 (RPG, 2002a). The recommendations included flattening the interior slopes of the basins to 2.5H:1V, which was completed during the liner replacement projects in 2003 and 2005.

Inspections of the east and south embankments for the East Ash Basin were also performed by RPG in 2002 and 2003. These inspections indicated areas of undercutting and soft soil at the downstream toe of the embankment, observations of some seepage from the embankment and localized erosion of the perimeter access road east of the East Ash Basin (RPG, 2002b and RPG, 2003). These inspections were performed before the liner replacement project for the East Ash Basin was completed. The eastern and southeastern slopes of the East Ash Basin, including the areas generally referenced in these inspections, were re-graded in 2016 (see Appendix A-2 and B-3).

Midwest Generation also retained Valdes Engineering to perform inspections of the East and West Ash Basins in 2009, 2014, and 2015. Inspection reports from these years did not document structural instability of the CCR units (Valdes, 2009, Valdes, 2014, and Valdes, 2015).

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3. References

Geosyntec, 2016a. Soil Properties Calculations, Waukegan Station, October.

Geosyntec, 2016b. Plans for the Construction of: East Ash Basin Slope Modification, Waukegan Generating Station, Lake County, Illinois, July, 2016.

Geosyntec, 2016c. Technical Specification Sections 02200 and 02770 for the Construction of: East Ash Basin Slope Modification, Waukegan Generating Station, Lake County, Illinois, July, 2016.

KPRG and Associates, Inc., 2005. Geotechnical Analysis of Soil Surrounding Settling Basins/Ponds, KPRG Project No. 15805, October.

Midwest Generation, 2002. East and West Ash Pond Liner Replacement Plans, Sections, and Details, Sheet B739

NUS Corporation, 1977. Waste Water Treatment Facilities Waukegan:
Ash Pond – Location and Plot Plan, Sheet No. 5082-C-5000.
Ash Pond – Detail Plan, Sheet No. 5082-C-5006.
Ash Pond – Sections & Details, Sheet No. 5082-C-5007.

NUS Corporation, 1978. Waste Water Treatment Facilities Waukegan:
Ash Pond Sump – Plan, Sections and Details, Sheet No. 5082 C 5501
Ash Pond Sump Weir – Plan, Sections & Details, Sheet No. 5082 C 5502
Ash Pond Sump and Weir – Miscellaneous Sections and Details, Sheet No. 5082 C 5503
Ash Pond Inlet Flume & Distribution – Trough Details, Sheet No. 5082 C 5507

Patrick Engineering, 2011. Hydrogeological Assessment Report, Waukegan Generating Station, Waukegan, Illinois, Patrick Project No. 21053.070, February.

RPG, 2002a. "Report of Engineering Study on Waukegan Generating Station #16 Ash Pond Repairs," 25 January 2002.

RPG, 2002b. "Ash Pond Berm Inspection Report," Letter to Chris Lux, 2 May 2002.

RPG, 2003b. "Ash Pond Berm Inspection Report," Letter to Chris Lux, 12 June 2003.

USGS, 2015. "Watershed Boundary Dataset," accessed via The National Map, http://viewer.nationalmap.gov/viewer/nhd.html?p=nhd, accessed 1 February 2016.

Valdes Engineering, 2009. "Ash Ponds Berm Inspection," Letter to Chris Lux, 29 June 2009.

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Valdes Engineering, 2014. "Ash Pond Berm Visual Assessment," Letter to Chris Lux, 12 June 2014.

Valdes Engineering, 2015. "Ash Pond Berm Visual Assessment," Letter to Chris Lux, 29 May 2015.

Attachments

Figure 1 – Site Location
Figure 2 – Area-Capacity Curves
Appendix A – Construction Drawings
- Appendix A-1 NUS Construction Drawings
- Appendix A-2 Liner Replacement Construction Drawing
- Appendix A-3 East Ash Basin Slope Modification Construction Drawings

Appendix B – Technical Specifications
- Appendix B-1 East Ash Basin Liner Replacement Specifications
- Appendix B-2 West Ash Basin Liner Replacement Specifications
- Appendix B-3 East Ash Basin Slope Modification Technical Specifications

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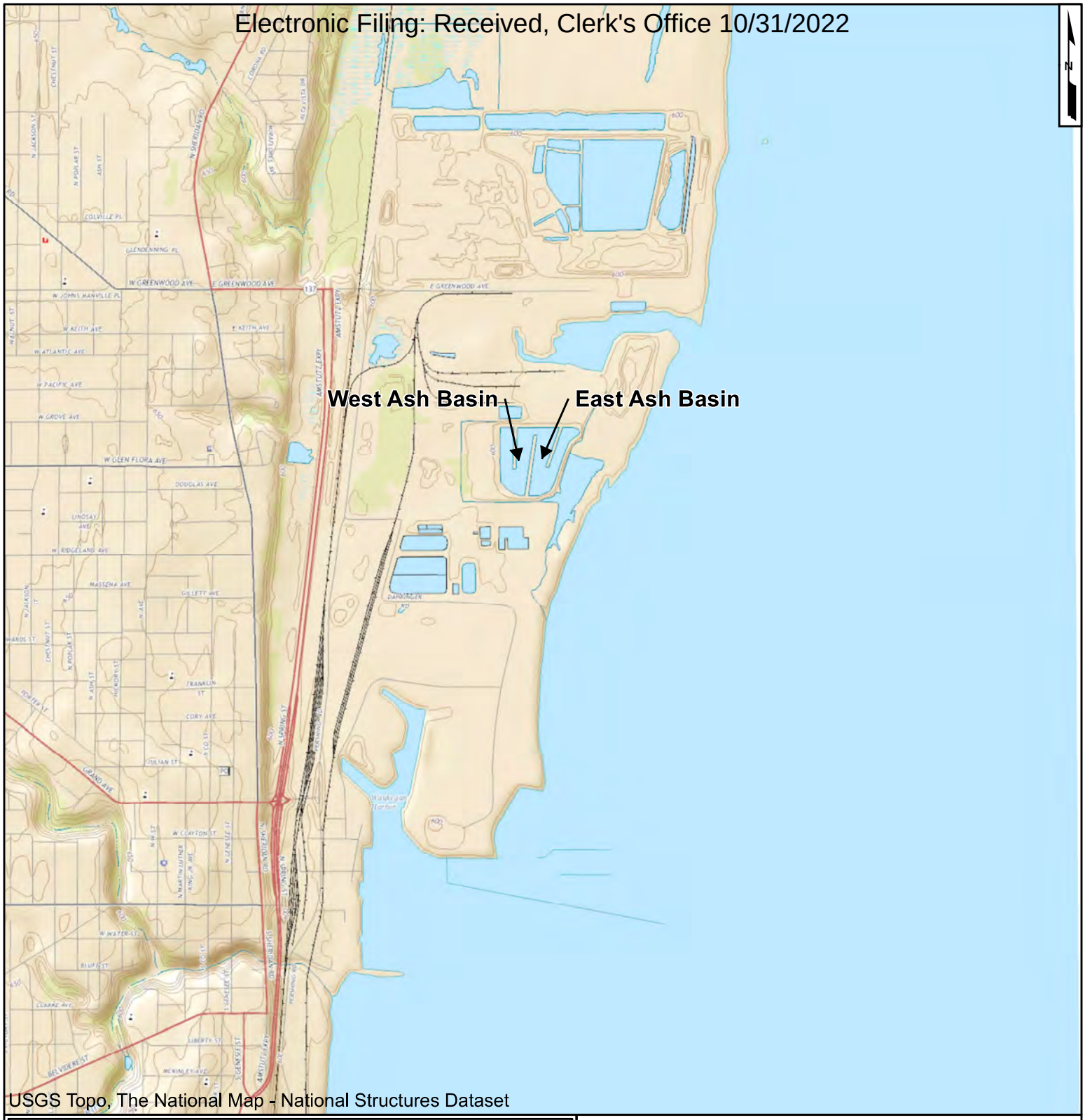


2,000 1,000 0 2,000 Feet

Site Location

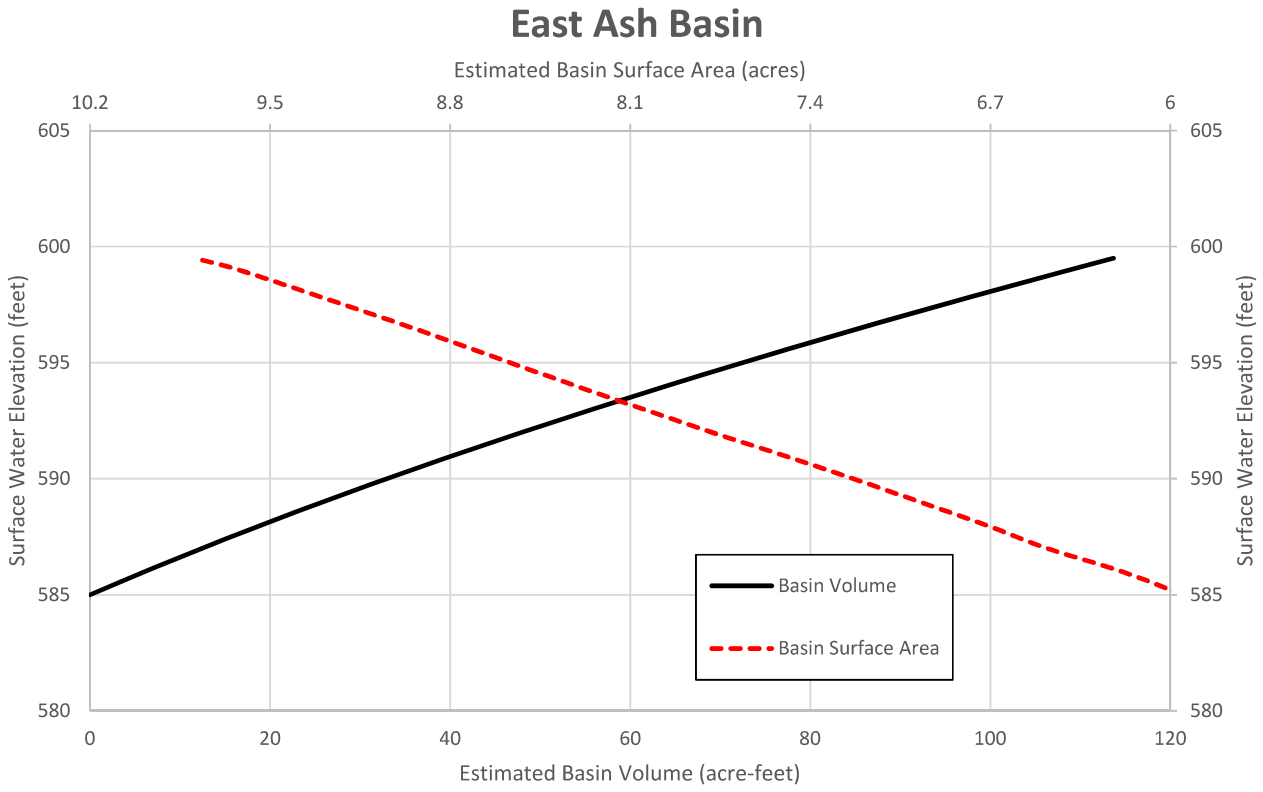
East and West Ash Basins
Waukegan Station
Waukegan, Illinois

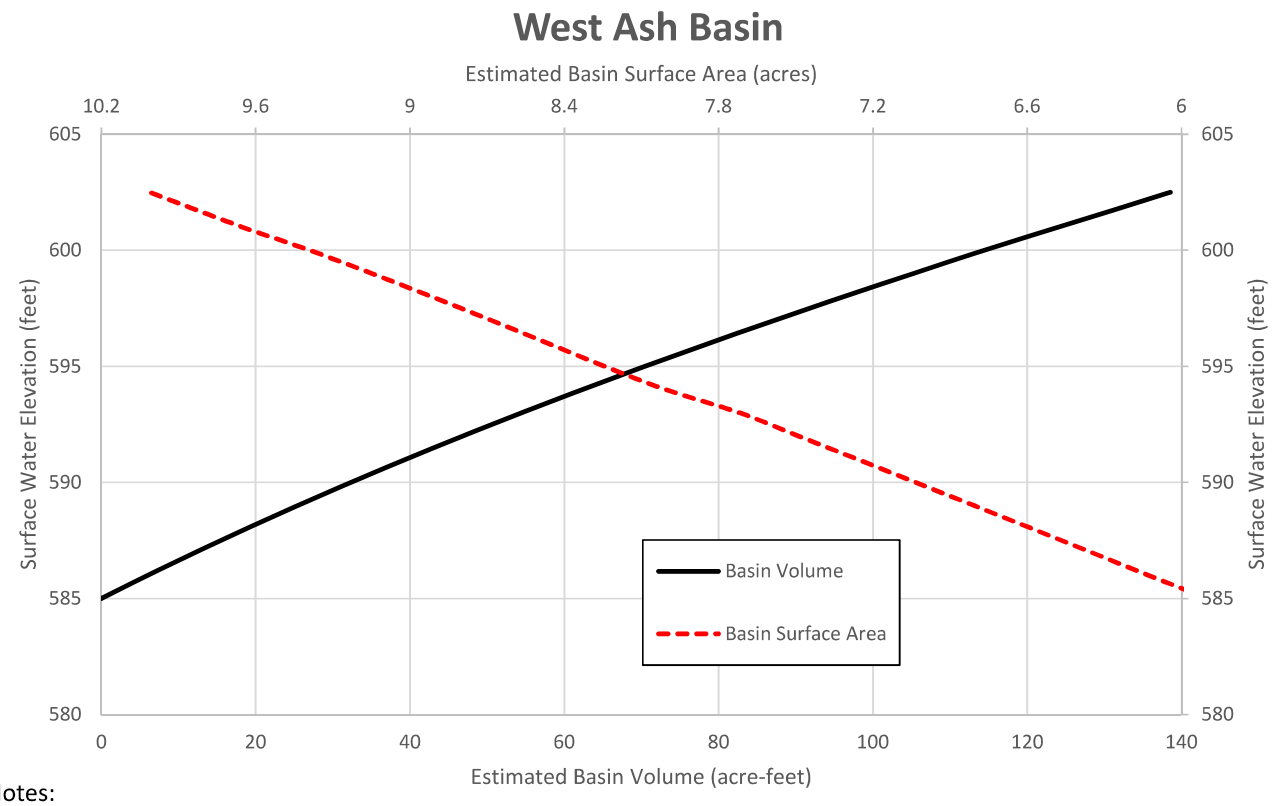
Geosyntec consultants

San Diego | October 2016

Figure 1

K:\GIS\WaukeganSiteLocation.mxd,JGordon





Notes:
(1) Surface water elevations are NAVD88.
(2) Basin volumes are estimated based on as-built information and 2015 site

Geosyntec consultants	AREA-CAPACITY CURVES EAST AND WEST ASH BASINS WAUKEGAN STATION WAUKEGAN, ILLINOIS	**FIGURE 2**
OCTOBER 2016		
SW0251-08		

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APPENDIX A

Construction Drawings

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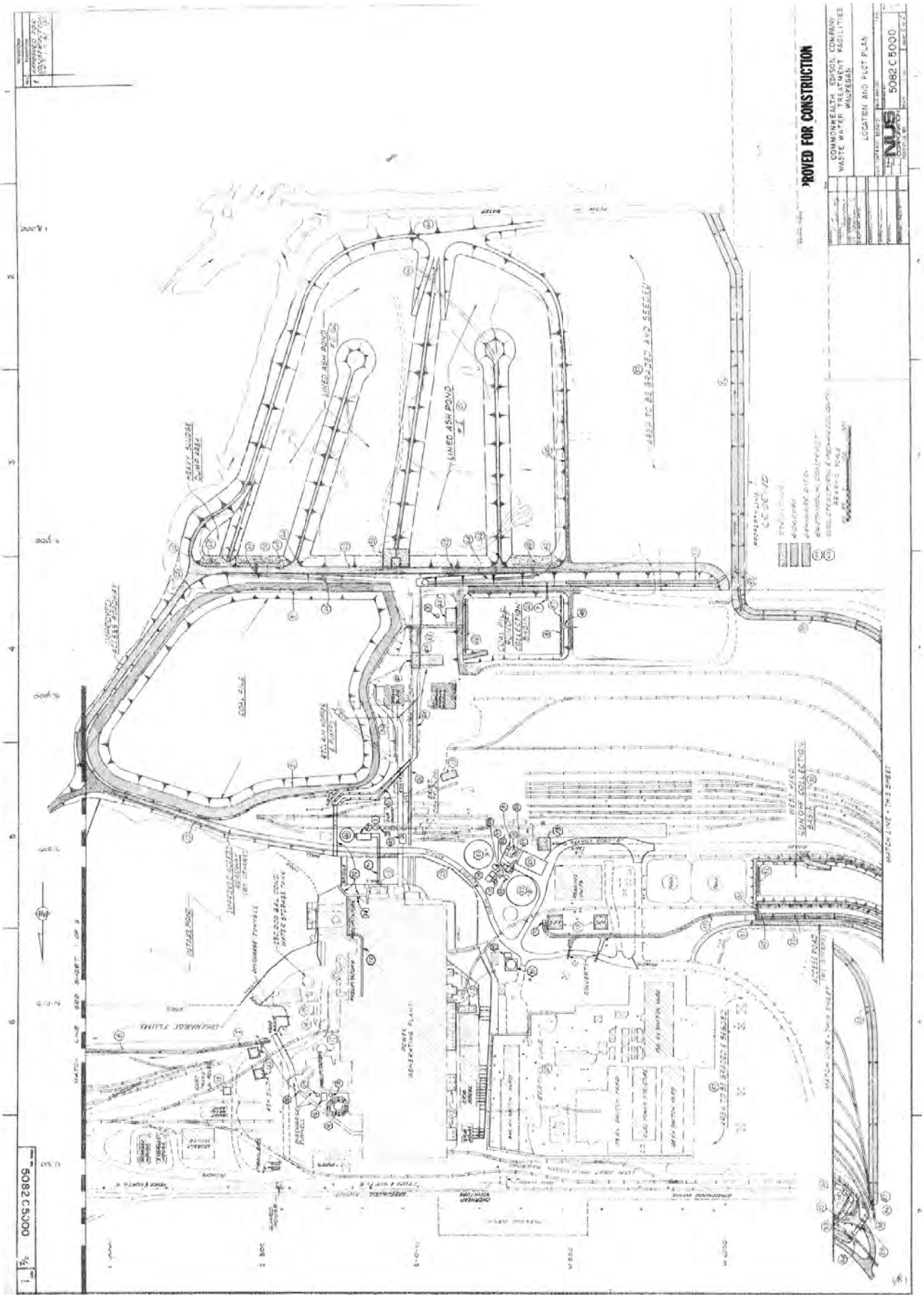
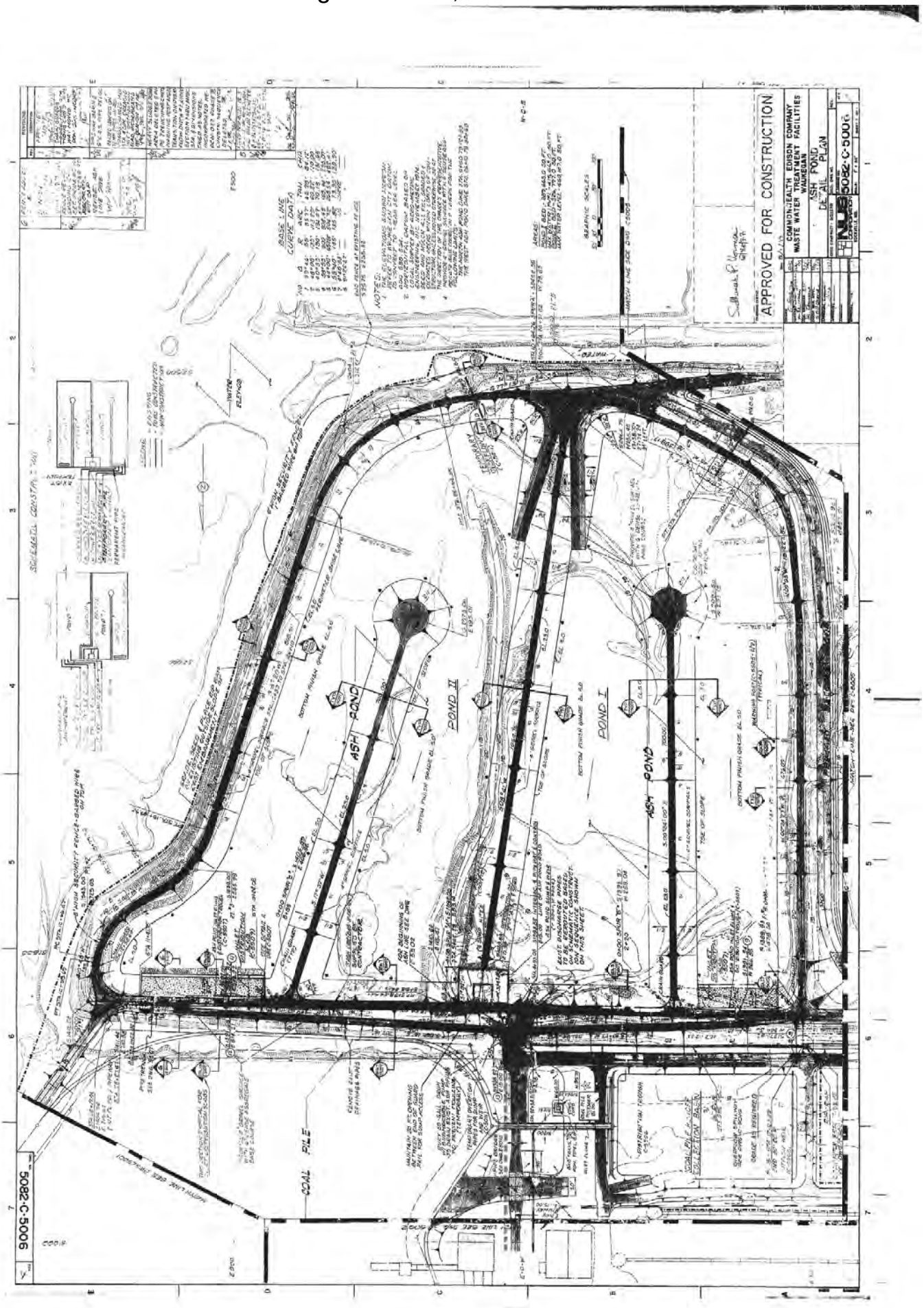
APPENDIX A-1

NUS Construction Drawings


APPROVED FOR CONSTRUCTION
COMMONWEALTH EDISON COMPANY
WASTE WATER TREATMENT FACILITIES
LOCATION AND PLOT PLAN
NJS
5082 C 5000
LINED ASH POND #1
LINED ASH POND #2
AREA TO BE GRADED AND SEEDED
COAL PILE
POWER GENERATING PLANT
ACCESS ROAD
SUMP
DISCHARGE FLUME
MATCH LINE - THIS SHEET
5082 C5000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ASH POND
DETAIL PLAN
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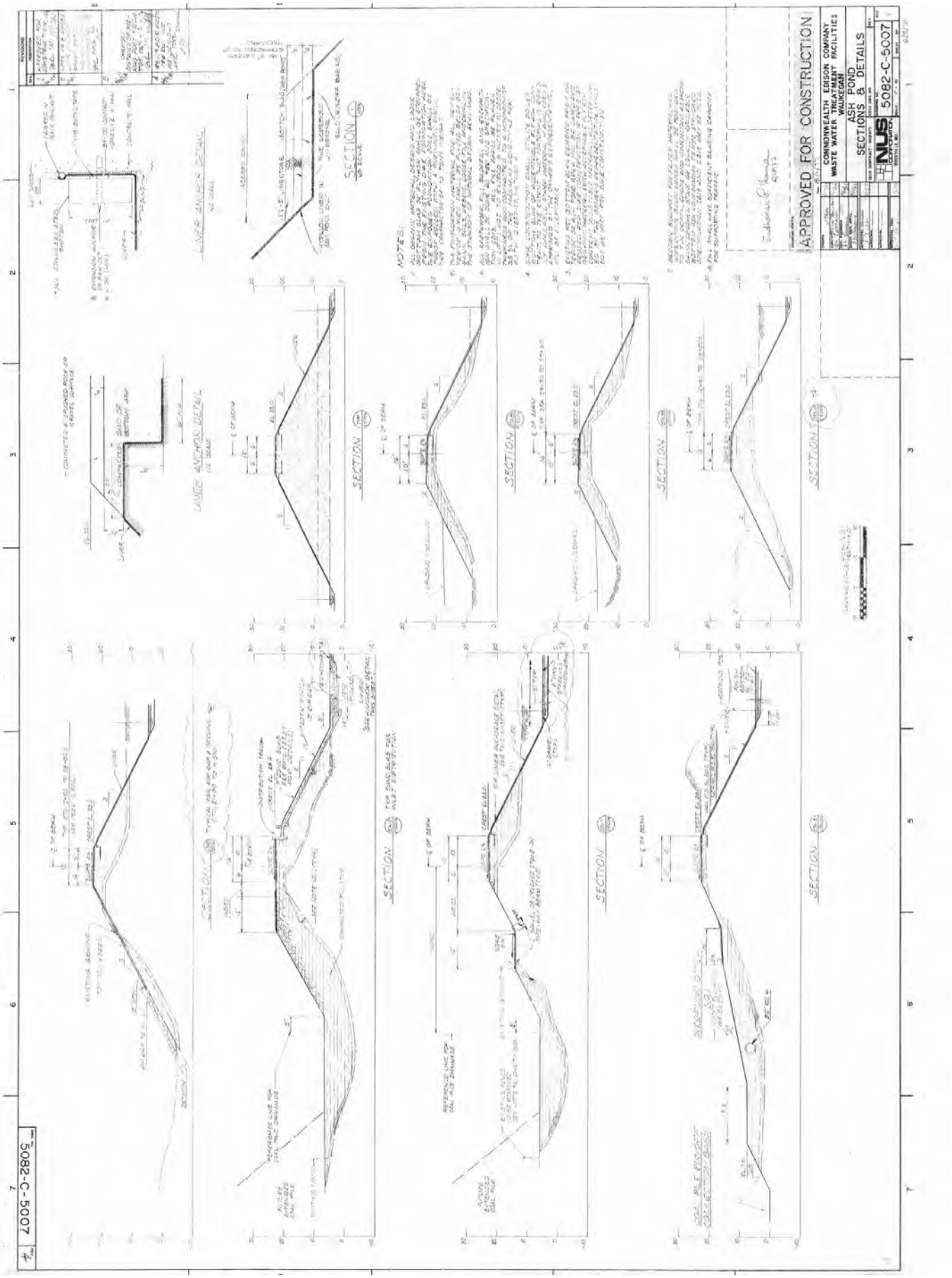
POND II
POND I
ASH POND
ASH POND
COAL PILE
COAL PILE RUNOFF COLLECTION BASIN
5082-C-5006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SECTION
LINER ANCHOR DETAIL
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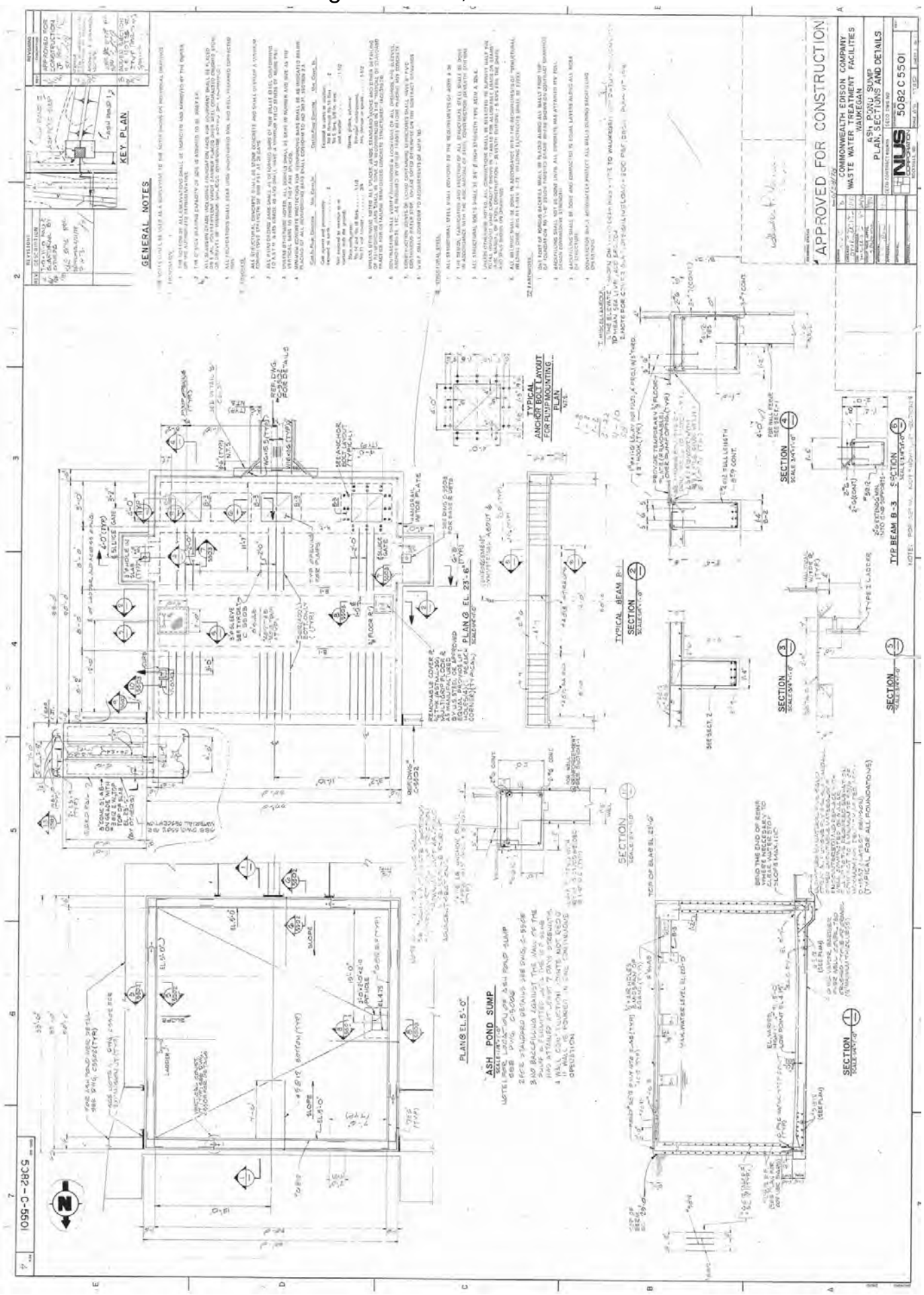
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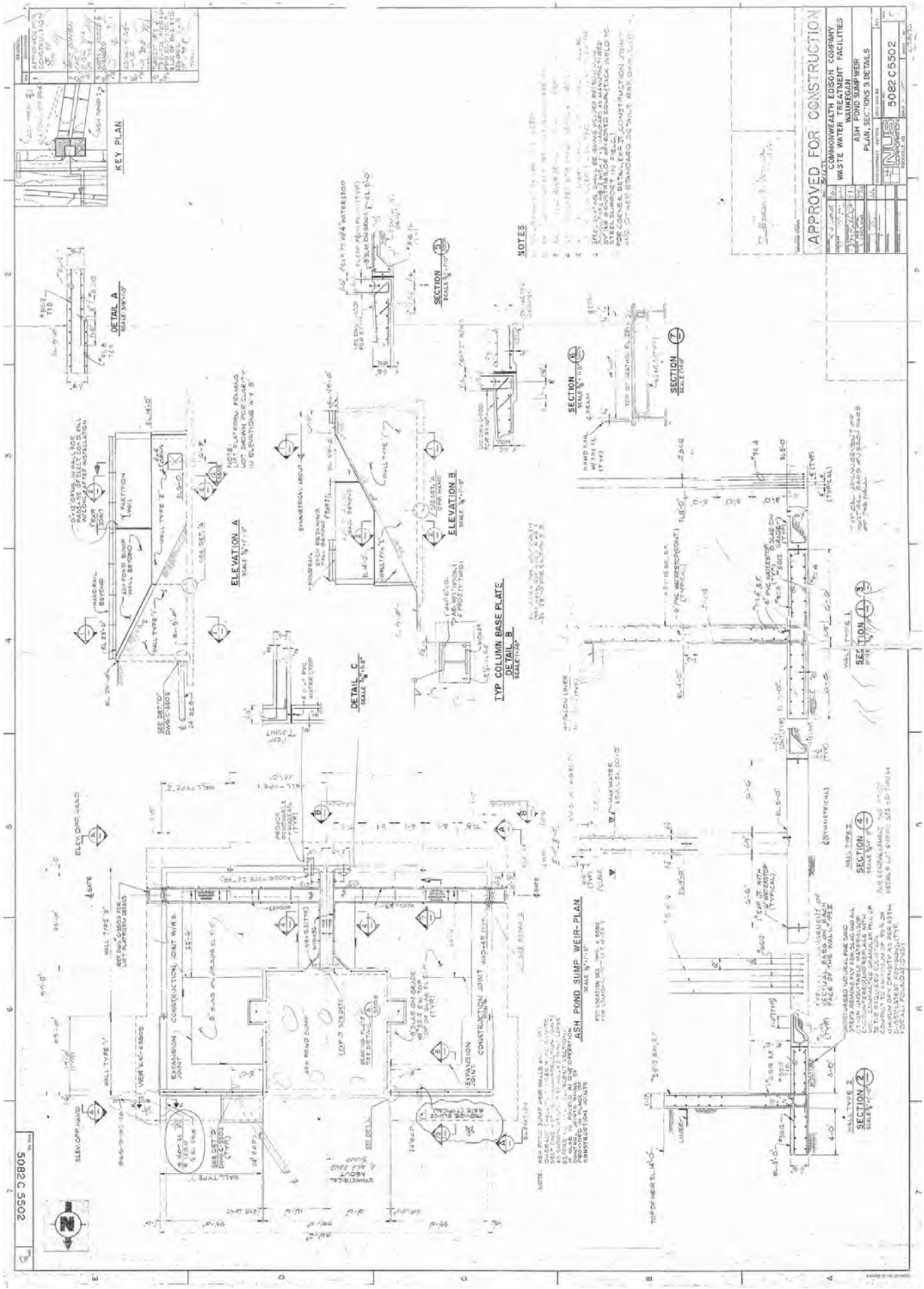
GENERAL NOTES
KEY PLAN
PLAN @ EL 23'-6"
PLAN @ EL 5'-0"
ASH POND SUMP
TYPICAL ANCHOR BOLT LAYOUT FOR PUMP MOUNTING PLAN
TYPICAL BEAM B-1 SECTION
TYP BEAM B-3 SECTION
SECTION
SECTION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ELEVATION B
DETAIL A
DETAIL C
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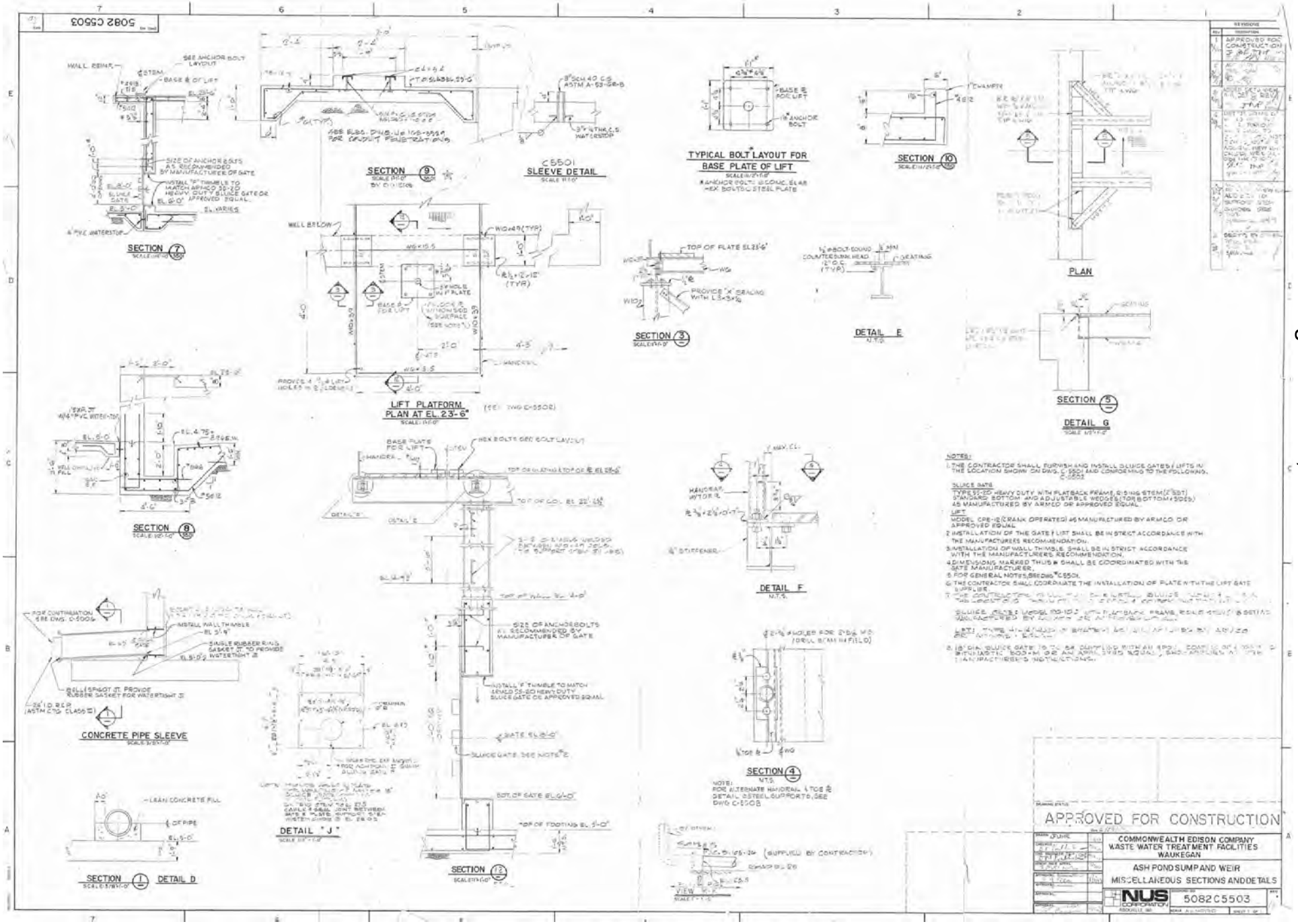

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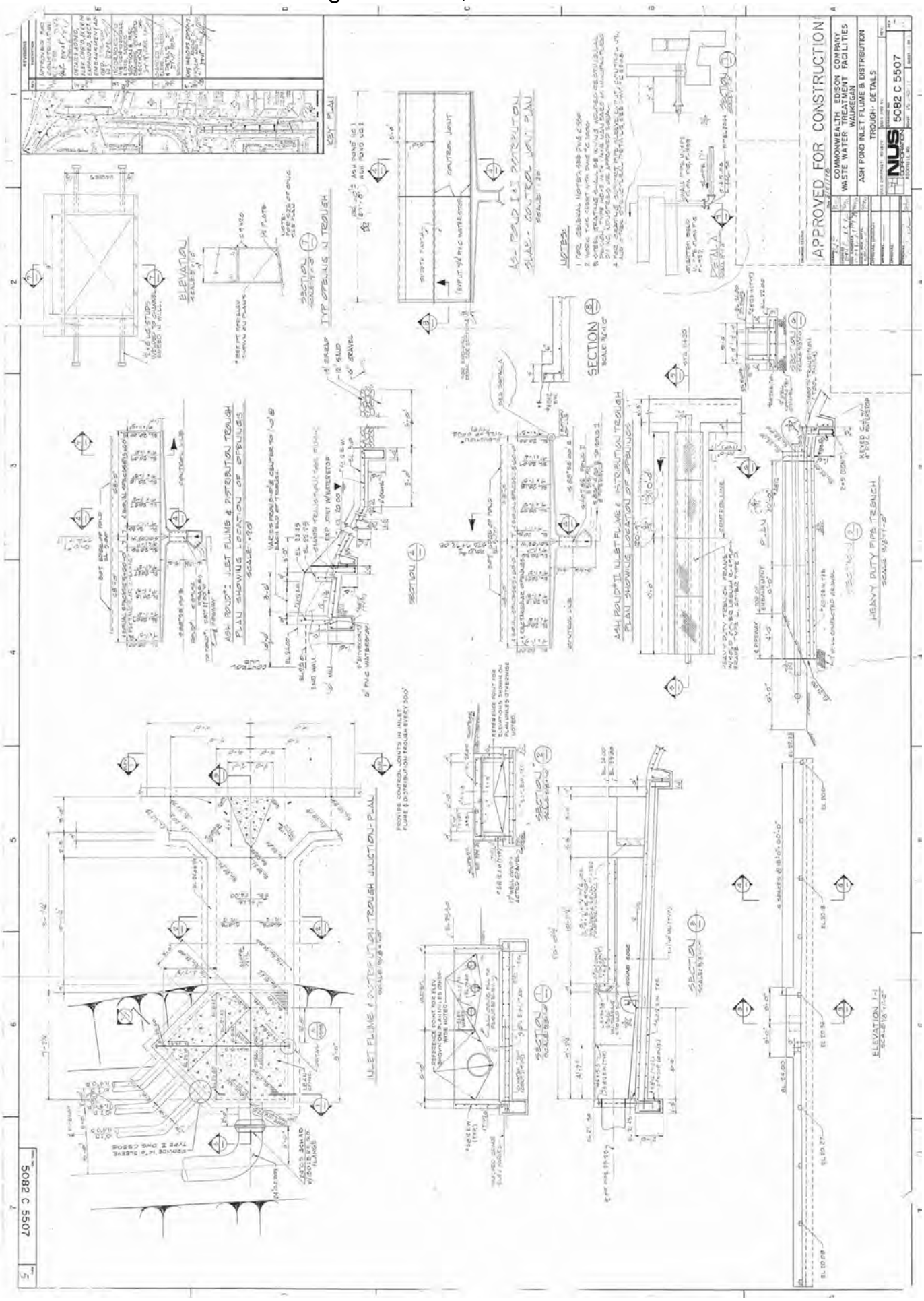
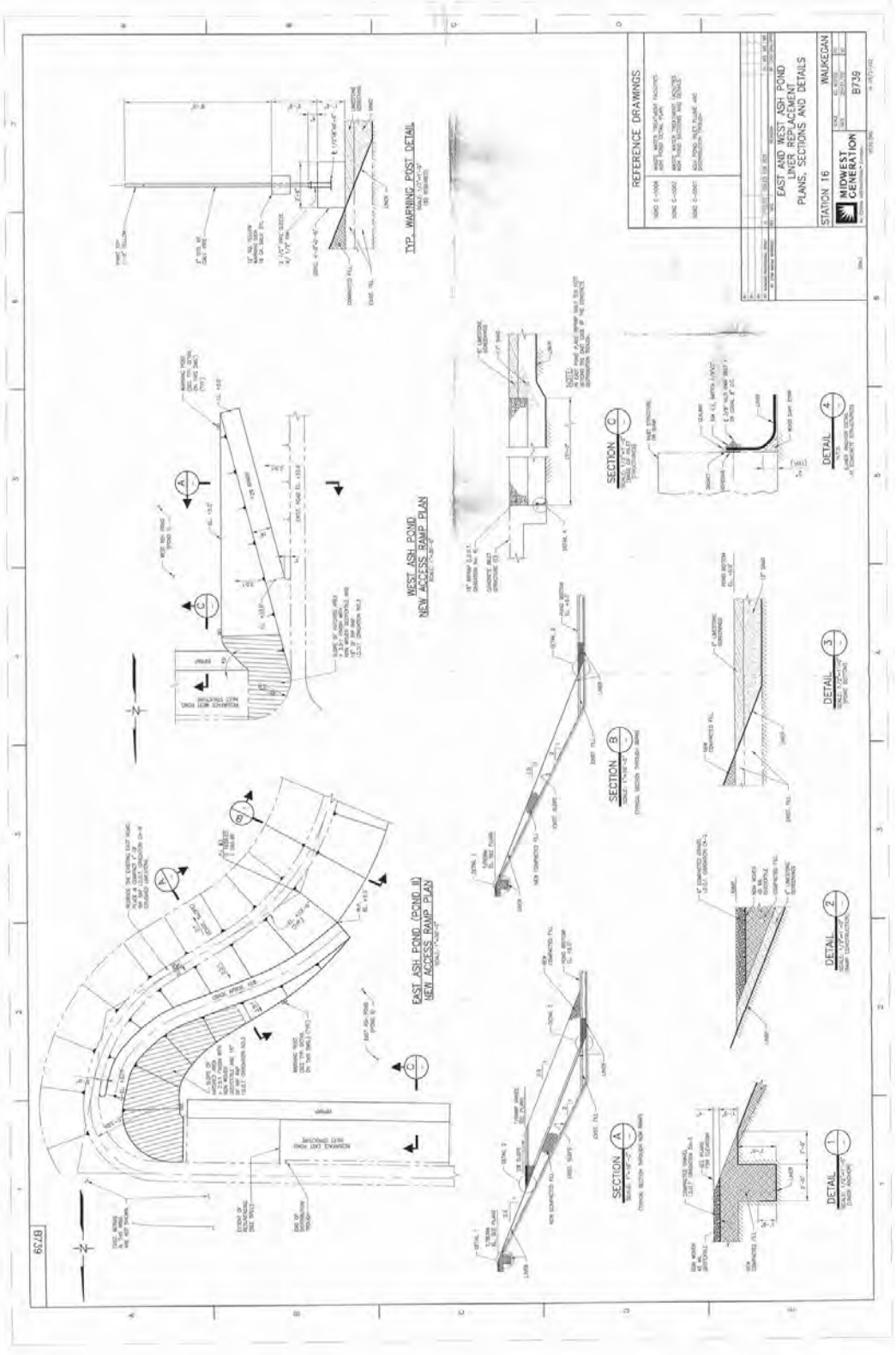

APPROVED FOR CONSTRUCTION
COMMONWEALTH EDISON COMPANY
WASTE WATER TREATMENT FACILITIES
WILL COUNTY STATION
ASH POND INLET FLUME & DISTRIBUTION TROUGH: DETAILS
NUS CORPORATION
5082 C 5507
ASH POND INLET FLUME & DISTRIBUTION TROUGH PLAN
ELEVATION
SECTION
INLET FLUME & DISTRIBUTION TROUGH JUNCTION PLAN
HEAVY DUTY PIPE TRENCH
ELEVATION I-I
5082 C 5507

Electronic Filing: Received, Clerk's Office 10/31/2022

APPENDIX A-2

Liner Replacement Construction Drawing


EAST AND WEST ASH POND
LINER REPLACEMENT
PLANS, SECTIONS AND DETAILS
STATION 16
WAUKEGAN
MIDWEST GENERATION
B739
REFERENCE DRAWINGS
TYP. WARNING POST DETAIL
WEST ASH POND
NEW ACCESS RAMP PLAN
EAST ASH POND (POND 3)
NEW ACCESS RAMP PLAN
SECTION
DETAIL

Electronic Filing: Received, Clerk's Office 10/31/2022

APPENDIX A-3

East Ash Basin Slope Modification Construction Drawings

PLANS FOR THE CONSTRUCTION OF:

EAST ASH BASIN SLOPE MODIFICATION

JULY 2016

WAUKEGAN GENERATING STATION
LAKE COUNTY, ILLINOIS

PREPARED FOR:

MIDWEST GENERATION, LLC

PREPARED BY:

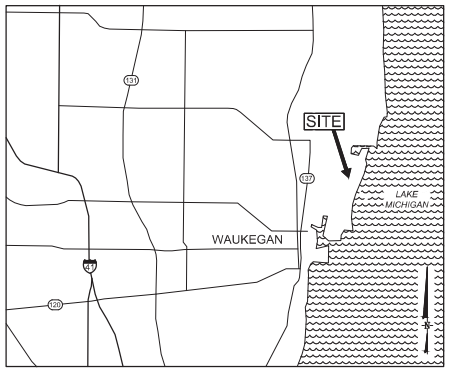
Geosyntec Consultants

3990 OLD TOWN AVENUE, SUITE A-101

SAN DIEGO, CALIFORNIA 92110

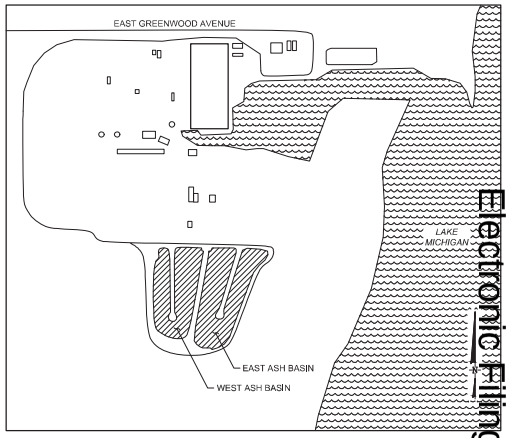
(619) 810-4000

www.geosyntec.com



VICINITY MAP

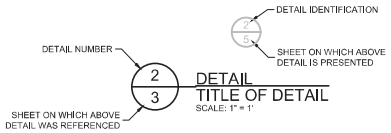
NOT TO SCALE



SITE LOCATION MAP

NOT TO SCALE

DETAIL IDENTIFICATION LEGEND



EXAMPLE: DETAIL NUMBER 2 PRESENTED ON SHEET NO. 5 WAS REFERENCED ON SHEET NO. 3.

NOTE: ABOVE REFERENCING SYSTEM ALSO APPLIES TO SECTION IDENTIFICATIONS.

DRAWING INDEX

DRAWING NO.	DRAWING TITLE	FILE NAME
1	TITLE INDEX AND LEGEND	SW0251-11-01
2	SITE PLAN	SW0251-11-02
3	GRADING PLAN	SW0251-11-03
4	CROSS SECTIONS	SW0251-11-04
5	DETAILS	SW0251-11-05
6	SWPPP	SW0251-11-06
7	SURVEY CONTROL POINTS	SW0251-11-07

GENERAL NOTES

1. THE WORK UNDERTAKEN BY THIS DOCUMENT IS FOR MIDWEST GENERATION, LLC, HEREAFTER REFERRED TO AS OWNER. GEOSYNTEC CONSULTANTS, HEREAFTER REFERRED TO AS ENGINEER, PERFORMED DESIGN.
2. THE PLANS AND OTHER DOCUMENTS SHALL GOVERN THE WORK AND SHALL BE CONSIDERED COMPLIMENTARY. ANYTHING FOUND IN THE PLANS AND NOT IN ANOTHER DOCUMENT OR FOUND IN ANOTHER DOCUMENT AND NOT IN THE PLANS SHALL BE CONSIDERED TO BE IN BOTH.
3. CONTRACTOR SHALL, UPON DISCOVERING ANY ERROR OR OMISSION IN THE PLANS, IMMEDIATELY BRING IT TO THE ATTENTION OF ENGINEER.
4. CONSTRACTOR SHALL BE RESPONSIBLE FOR THE PROTECTION OF PUBLIC AND PRIVATE PROPERTY ADJACENT TO THE WORK, AND EXERCISE DUE CAUTION TO AVOID DAMAGE TO SUCH PROPERTY. CONTRACTOR SHALL NOT PERFORM ANY WORK OR DISTURBANCE OUTSIDE OF THE WORK ZONE AND APPROVED SITE ACCESS ROUTES WITHOUT PREAPPROVAL BY THE OWNER.
5. THROUGHOUT ALL PHASES OF CONSTRUCTION, INCLUDING SUSPENSION OF WORK, AND UNTIL FINAL ACCEPTANCE OF THE PROJECT, CONTRACTOR SHALL KEEP THE WORK SITE CLEAN AND FREE FROM RUBBISH AND DEBRIS.
6. THE WORK SHALL BE CONDUCTED TO MINIMIZE DISTURBANCE TO ONGOING PLANT OPERATIONS. WORK THAT IMPACTS PLANT OPERATIONS SHALL BE COORDINATED THROUGH THE OWNER.
7. CONTRACTOR SHALL KEEP A COPY OF THE PLANS AND OTHER DOCUMENTS AT THE WORK SITE, TO WHICH THE OWNER SHALL HAVE ACCESS UPON REQUEST.
8. CONTRACTOR SHALL ASCERTAIN THE EXISTENCE OF ANY CONDITIONS AFFECTING THE COST OF THE WORK WHICH WOULD HAVE BEEN DISCLOSED BY REASONABLE EXAMINATION OF THE SITE.
9. EXISTING IMPROVEMENT VISIBLE AT THE JOB SITE, FOR WHICH NO SPECIFIC DISPOSITION IS MADE ON THE PLANS, BUT WHICH COULD REASONABLY BE ASSUMED TO INTERFERE WITH SATISFACTORY COMPLETION OF THE WORK, SHALL BE BROUGHT TO THE ATTENTION OF OWNER.
10. ALL MATERIALS, PARTS, AND EQUIPMENT FURNISHED BY CONTRACTOR SHALL BE NEW, HIGH GRADE, AND FREE OF DEFECTS. QUALITY OF WORK SHALL BE IN ACCORDANCE WITH GENERALLY ACCEPTED STANDARDS. MATERIALS AND WORK QUALITY SHALL BE SUBJECT TO APPROVAL BY ENGINEER.
11. DEFECTIVE WORK OR MATERIAL SHALL BE REMOVED IMMEDIATELY FROM THE SITE BY CONTRACTOR, AT CONTRACTOR'S EXPENSE, WHEN SO DIRECTED.
12. SOIL AND ROCK MATERIALS, REQURIED FOR THE WORK, SHALL BE STOCKPILED AT LOCATIONS DESIGNATED BY THE OWNER AND APPROVED BY ENGINEER.
13. CONTRACTOR SHALL PROVIDE AND MAINTAIN FACILITIES TO PROTECT ALL WORK AND EQUIPMENT WHETHER IN PLACE OR NOT.
14. CONTRACTOR MAY SUPPLY EQUIVALENT REPLACEMENTS FOR ANY MATERIALS REQUIRED FOR COMPLETION FO THE WORK, SUBJECT TO APPROVAL BY ENGINEER.
15. CONTRACTOR SHALL NOT INTERRUPT THE SERVICE FUNCTION OR DISTURB THE SUPPORT OF ANY UTILITY WITHOUT AUTHORIZATION FROM OWNER.
16. UPON LEARNING OF THE EXISTENCE OF ANY UTILITY OMITTED FROM OR SHOWN INCORRECTLY ON THE PLANS, CONTRACTOR SHALL IMMEDIATELY NOTIFY ENGINEER IN WRITING.
17. DRAWINGS ARE SCALED TO SIZE 22X34 INCH SHEETS. REPRODUCTION OF SHEETS MAY DISTORT DRAWINGS AND SCALE.

LEGEND

- PROOF ROLLED SUBGRADE
- SELECT FILL
- EXISTING GRADE
- AGGREGATE BASE
- GEOTEXTILE
- GEOMEMBRANE
- $\times^{125}$ PROPOSED GRADE POINT

GENERAL LINES

- 600 PROPOSED GRADING CONTOUR (10')
- PROPOSED GRADING CONTOUR (2')
- 600 EXISTING GRADE CONTOUR (10')
- EXISTING GRADE CONTOUR (2')
- LIMITS OF PROPOSED GRADING
- FLOW LINE

ABBREVIATIONS

AC	ASPHALT CONCRETE	L	LENGTH
APPROX.	APPROXIMATE	LF	LINEAL FEET
C	CENTER LINE	MH	MANHOLE
CF	CUBIC FOOT	MIN.	MINIMUM
DIA.	DIAMETER	N	NORTHING
DIM.	DIMENSION	NTS	NOT TO SCALE
E	EASTING	NO.	NUMBER
EL.	ELEVATION	OC	ON CENTER
EW	EACH WAY	oz.	OUNCE
FG	FINISH GRADE	OD	OUTSIDE DIAMETER
F	FLOW LINE	R	RADIUS
GALV.	GALVANIZED	SCH.	SCHEDULE
HDPE	HIGH DENSITY POLYETHYLENE	STD.	STANDARD
INV.	INVERT	TYP.	TYPICAL

ISSUED FOR BID

REV	DATE	DESCRIPTION	DRN	APP

Geosyntec consultants

3990 OLD TOWN AVENUE, SUITE A-101
SAN DIEGO, CA 92110
PHONE: 619.810.4000

TITLE: TITLE, INDEX, AND LEGEND

PROJECT: EAST ASH BASIN SLOPE MODIFICATION

SITE: WAUKEGAN GENERATING STATION
LAKE COUNTY, ILLINOIS

THIS DRAWING MAY NOT BE ISSUED FOR PROJECT TENDER OR CONSTRUCTION, UNLESS SEALED.

Jane Soule
SIGNATURE
7/1/16
DATE

JANE W. SOULE
062-067766
LICENSED PROFESSIONAL ENGINEER
STATE OF ILLINOIS

DESIGN BY:	JG	DATE:	JULY 2016
DRAWN BY:	JA	PROJECT NO.:	SW0251-11
CHECKED BY:	GC	FILE:	SW0251-11-01
REVIEWED BY:	JS	DRAWING NO.:	1 OF 7
APPROVED BY:	JS		

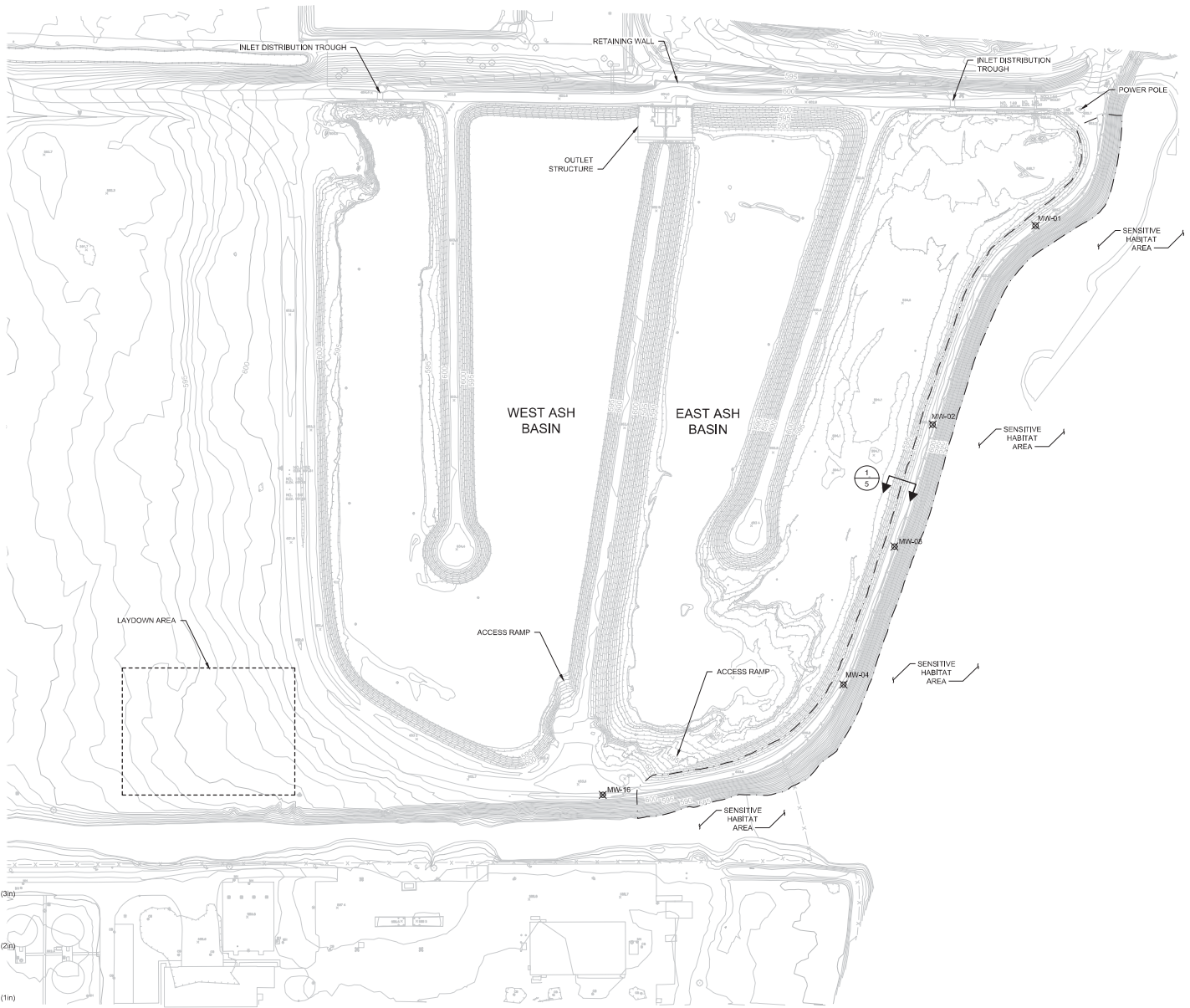
(3in) (2in) (1in)

(1in) (2in) (3in) (4in)

SCALE IS BASED ON 22" X 34" NON-REDUCED SHEET SIZE (BORDER = 21" X 32")

Z:\CADD\Planset\SW0251-11 Slope Adjust_Current Set\SW0251-11-01.dwg Last Edited by: jamus on 7/6/2016 10:59 AM

Electronic Filing: Received, Clerk's Office 10/31/2022



LEGEND

- EXISTING GROUND MAJOR CONTOUR (10') [NOTE 2]
- EXISTING GROUND MINOR CONTOUR (2') [NOTE 2]
- EXISTING FENCE
- MW-01 MONITORING WELL
- LIMITS OF GRADING

NOTES

1. ALL PLANS IN THIS PLAN SET WERE DRAWN BASED ON THE FOLLOWING DATUM SOURCE:
   HORIZONTAL CONTROL - NAD83 ILLINOIS STATE PLANE EAST, U.S. feet
   VERTICAL CONTROL - NAVD 88., U.S. feet
2. EXISTING PHOTOGRAMMETRIC SURVEY DATA PROVIDED BY GEO TERRA. FLIGHT DATE: 4 DECEMBER 2015.
3. BASINS ARE CURRENTLY LINED WITH A SMOOTH HDPE GEOMEMBRANE ANCHORED NEAR THE INTERIOR CREST OF THE EMBANKMENT.
4. EXISTING TOPOGRAPHY ABOVE APPROXIMATE ELEVATION OF 587 FT REPRESENTS APPROXIMATE CCR DEPOSITS WITHIN EASTERN ASH BASIN.
5. SENSITIVE HABITAT IS PRESENT AT THE DOWNSTREAM TOE OF THE EASTERN AND SOUTHERN EMBANKMENTS.

0 80' 160'
SCALE IN FEET

REV	DATE	DESCRIPTION	DRN	APP

Geosyntec consultants
3990 OLD TOWN AVENUE, SUITE A-101
SAN DIEGO, CA 92110
PHONE: 619.810.4000

TITLE: SITE PLAN

PROJECT: EAST ASH BASIN SLOPE MODIFICATION

SITE: WAUKEGAN GENERATING STATION
LAKE COUNTY, ILLINOIS

THIS DRAWING MAY NOT BE ISSUED FOR PROJECT TENDER OR CONSTRUCTION, UNLESS SEALED.

Jane Soule
SIGNATURE
7/1/16
DATE

JANE W. SOULE 062-067768 LICENSED PROFESSIONAL ENGINEER STATE OF ILLINOIS

DESIGN BY:	JG	DATE:	JULY 2016
DRAWN BY:	JA	PROJECT NO.:	SW0251-11
CHECKED BY:	GC	FILE:	SW0251-11-02
REVIEWED BY:	JS	DRAWING NO.:	2 OF 7
APPROVED BY:	JS		

ISSUED FOR BID

(1in) (2in) (3in) (4in)
SCALE IS BASED ON 22" X 34" NON-REDUCED SHEET SIZE (BORDER = 21" X 32")

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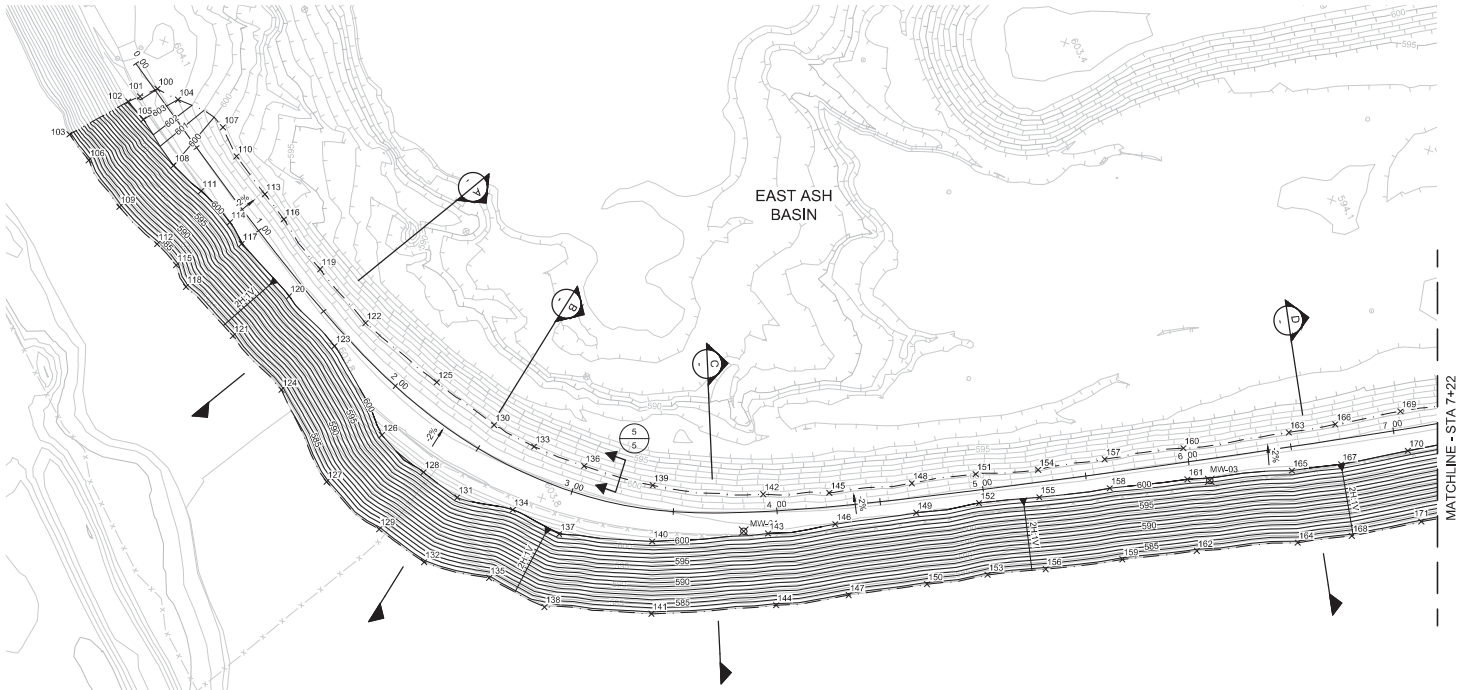
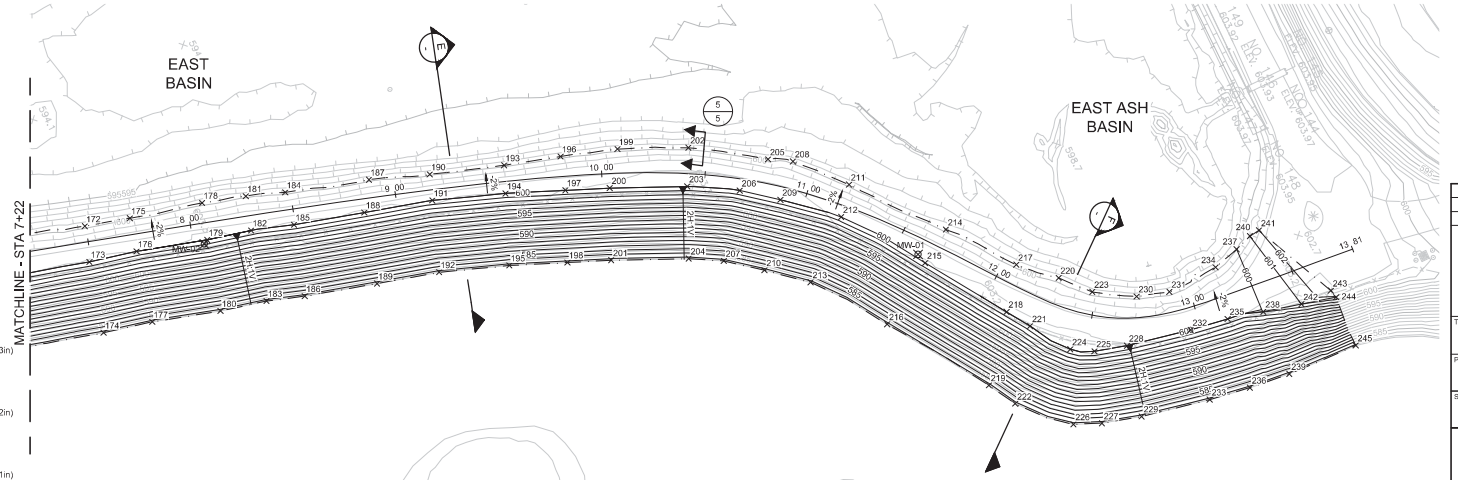
Electronic Filing: Received, Clerk's Office 10/31/2022





ISSUED FOR BID

LEGEND

- EXISTING GROUND MAJOR CONTOUR (10') [NOTE 2]
- EXISTING GROUND MINOR CONTOUR (2') [NOTE 2]
- EXISTING FENCE
- PROPOSED GRADE MAJOR CONTOUR (10')
- PROPOSED GRADE MINOR CONTOUR (2')
- LIMITS OF GRADING
- MW-01 MONITORING WELL
- CROSS SECTION LOCATION
- 125 SURVEY CONTROL POINT

NOTES

1. ALL PLANS IN THIS PLAN SET WERE DRAWN BASED ON THE FOLLOWING DATUM SOURCE:
   HORIZONTAL CONTROL - NAD83 ILLINOIS STATE PLANE EAST, U.S. feet
   VERTICAL CONTROL - NAVD 88., U.S. feet
2. EXISTING PHOTOGRAMMETRIC SURVEY DATA PROVIDED BY GEO TERRA. FLIGHT DATE: 4 DECEMBER 2015.
3. CONTRACTOR SHALL REMOVE EXISTING FENCE AND GATES WITHIN WORK AREA AND PROPERLY DISPOSE OF OFFSITE.
4. CONTRACTOR SHALL INSTALL AND MAINTAIN 4-FT HIGH ORANGE BARRIER FENCING AT THE TOE OF THE SLOPE DURING THE DURATION OF THE WORK.
5. GRADING ELEVATIONS AT CREST OF EMBANKMENT REPRESENT TOP OF ROAD SURFACING LAYER.

0 30' 60'
SCALE IN FEET

REV	DATE	DESCRIPTION	DRN	APP

Geosyntec consultants
3990 OLD TOWN AVENUE, SUITE A-101
SAN DIEGO, CA 92110
PHONE: 619.810.4000

TITLE: GRADING PLAN

PROJECT: EAST ASH BASIN SLOPE MODIFICATION

SITE: WAUKEGAN GENERATING STATION
LAKE COUNTY, ILLINOIS

THIS DRAWING MAY NOT BE ISSUED FOR PROJECT TENDER OR CONSTRUCTION, UNLESS SEALED.

Jane Soule
SIGNATURE
7/1/16
DATE

JANE W. SOULE 062-067766 LICENSED PROFESSIONAL ENGINEER STATE OF ILLINOIS

DESIGN BY:	JG	DATE:	JULY 2016
DRAWN BY:	JA	PROJECT NO.:	SW0251-11
CHECKED BY:	GC	FILE:	SW0251-11-03
REVIEWED BY:	JS	DRAWING NO.:	3 OF 7
APPROVED BY:	JS		

SCALE IS BASED ON 22" X 34" NON-REDUCED SHEET SIZE (BORDER = 21" X 32")

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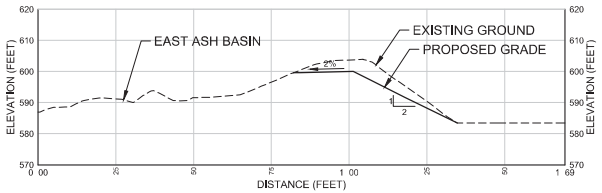
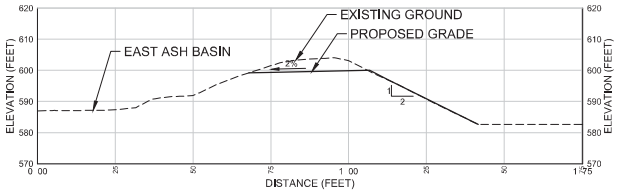
Electronic Filing: Received, Clerk's Office 10/31/2022



SECTION A
(STA. 1 49)



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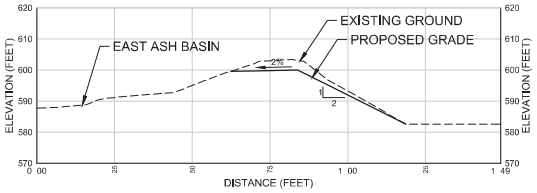
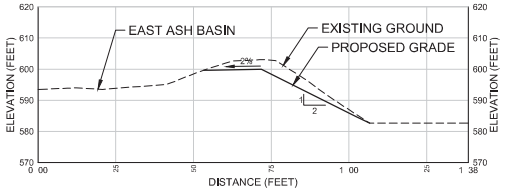
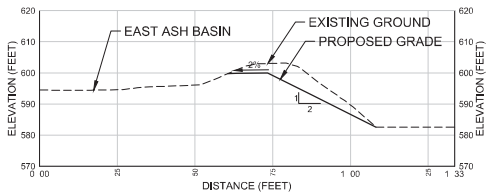
(STA. 2 50)



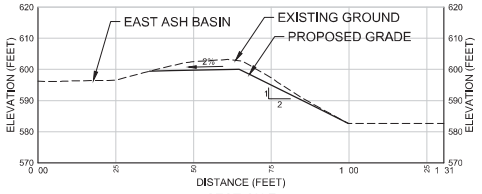
SECTION C
(STA. 3 70)



SECTION D
(STA. 6 58)



SECTION E
(STA. 9 29)



SECTION F
(STA. 12 35)

LEGEND

EXISTING GROUND

PROPOSED GRADE

NOTES

1. ALL PLANS IN THIS PLAN SET WERE DRAWN BASED ON THE FOLLOWING DATUM SOURCE:
   HORIZONTAL CONTROL - NAD83 ILLINOIS STATE PLANE EAST, U.S. feet
   VERTICAL CONTROL - NAVD 88., U.S. feet
2. EXISTING PHOTOGRAMMETRIC SURVEY DATA PROVIDED BY GEO TERRA. FLIGHT DATE: 4 DECEMBER 2015.
3. FOR SECTION LOCATIONS, SEE SHT 3.

0 20' 40'
SCALE IN FEET

REV	DATE	DESCRIPTION	DRN	APP

Geosyntec consultants
3990 OLD TOWN AVENUE, SUITE A-101
SAN DIEGO, CA 92110
PHONE: 619.810.4000

TITLE: CROSS SECTIONS

PROJECT: EAST ASH BASIN SLOPE MODIFICATION

SITE: WAUKEGAN GENERATING STATION
LAKE COUNTY, ILLINOIS

THIS DRAWING MAY NOT BE ISSUED FOR PROJECT TENDER OR CONSTRUCTION, UNLESS SEALED.

SIGNATURE
7/1/16
DATE

JANE W. SOULE
062-067768
LICENSED PROFESSIONAL ENGINEER
STATE OF ILLINOIS

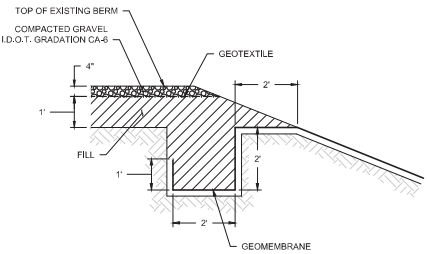
DESIGN BY:	JG	DATE:	JULY 2016
DRAWN BY:	JA	PROJECT NO.:	SW0251-11
CHECKED BY:	GC	FILE:	SW0251-11-04
REVIEWED BY:	JS	DRAWING NO.:	4 OF 7
APPROVED BY:	JS		

ISSUED FOR BID

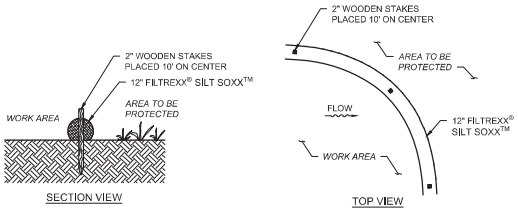
(3in) (2in) (1in)
(1in) (2in) (3in) (4in)
SCALE IS BASED ON 22" X 34" NON-REDUCED SHEET SIZE (BORDER = 21" X 32")

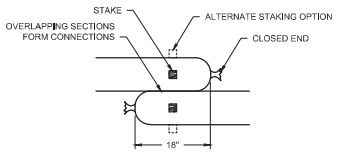
Z:\CADD\Plansets\SW0251-11 Slope Adjust_Current Set\SW0251-11-04.dwg Last Edited by: jamus on 7/1/2016 3:01 PM

Electronic Filing: Received, Clerk's Office 10/31/2022



1/2 DETAIL
EXISTING ANCHOR TRENCH
SCALE: NTS

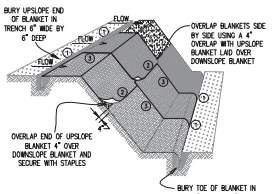


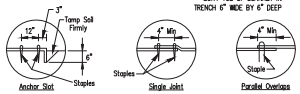


COMPOST SOCK CONNECTION/ATTACHMENT DETAIL

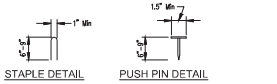
NOTES:
1. ALL MATERIAL TO MEET FILTREXX® SPECIFICATIONS.
2. SILT SOXX™ FILL TO MEET APPLICATION REQUIREMENTS.
3. COMPOST MATERIAL TO BE DISPERSED ON SITE, AS DETERMINED BY ENGINEER.

2/6 DETAIL
COMPOST SOCK
SCALE: NTS





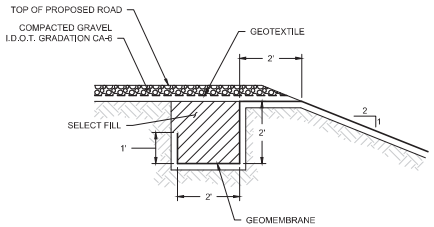
DETAIL 1 DETAIL 2 DETAIL 3



STAPLE DETAIL PUSH PIN DETAIL

NOTES:
1. Staples shall be placed in a diamond pattern at 2 per s.y. for stitched blankets. Non-stitched shall use 4 staples per s.y. of material. This equates to 200 staples with stitched blanket and 400 staples with non-stitched blanket per 100 s.y. of material.
2. Staple or push pin lengths shall be selected based on soil type and conditions. (minimum staple length is 6").
3. Erosion control material shall be placed in contact with the soil over a prepared seedbed.
4. All anchor slots shall be stapled at approximately 12" intervals.
5. Erosion Control Blanket shall be BioNet™ SC150BN® Erosion Control Blanket or approved equivalent. Blanket must be made of 100% biodegradable materials (i.e. no plastic netting).
6. Anchor trench shall be be 2' from top of slope.

3/6 DETAIL
EROSION CONTROL BLANKET
INSTALLATION
SCALE: NTS



NOTES:
1. Grading shown on Sheet 3 represents the top of the road surfacing layer.
2. Geotextile shall be Propex 200ST or equivalent.

4/3 DETAIL
ANCHOR TRENCH
SCALE: NTS

(3in)
(2in)
(1in)
(1in) (2in) (3in) (4in)
SCALE IS BASED ON 22" X 34" NON-REDUCED SHEET SIZE (BORDER = 21" X 32")

ISSUED FOR BID

REV	DATE	DESCRIPTION	DRN	APP

Geosyntec consultants
3990 OLD TOWN AVENUE, SUITE A-101
SAN DIEGO, CA 92110
PHONE: 619.810.4000

TITLE: DETAILS

PROJECT: EAST ASH BASIN SLOPE MODIFICATION

SITE: WAUKEGAN GENERATING STATION
LAKE COUNTY, ILLINOIS

THIS DRAWING MAY NOT BE ISSUED FOR PROJECT TENDER OR CONSTRUCTION, UNLESS SEALED.

Jane Soule
SIGNATURE
7/1/16
DATE

JANE W. SOULE
062-067766
LICENSED
PROFESSIONAL
ENGINEER
STATE OF ILLINOIS

DESIGN BY:	JG	DATE:	JULY 2016
DRAWN BY:	JA	PROJECT NO.:	SW0251-11
CHECKED BY:	GC	FILE:	SW0251-11-05
REVIEWED BY:	JS	DRAWING NO.:	5 OF 7
APPROVED BY:	JS		

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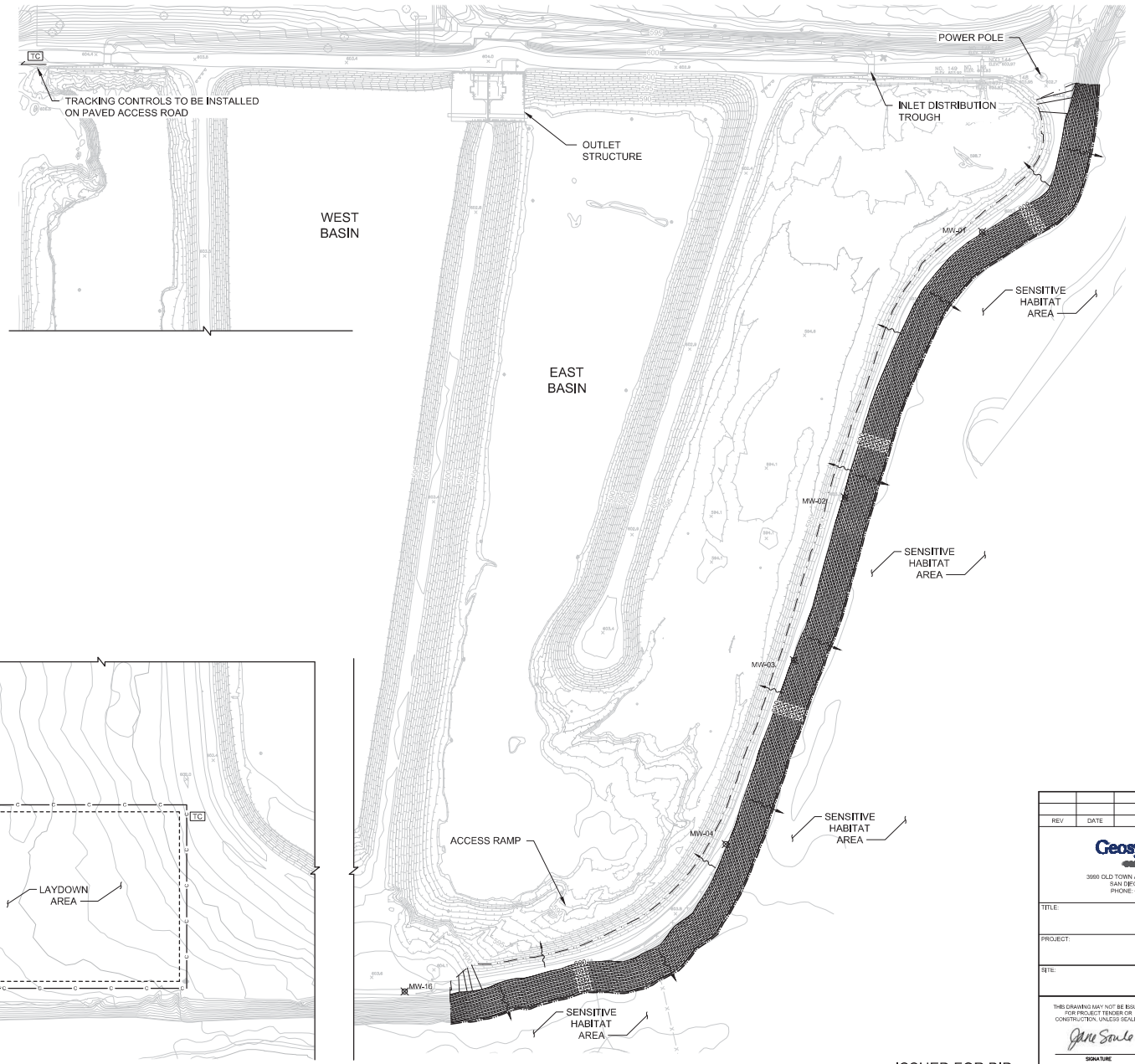

LEGEND

- EXISTING GROUND MAJOR CONTOUR (10') [NOTE 2]
- EXISTING GROUND MINOR CONTOUR (2') [NOTE 2]
- PROPOSED GRADE MAJOR CONTOUR (10')
- PROPOSED GRADE MINOR CONTOUR (2')
- LIMITS OF GRADING
- MW-01 MONITORING WELL
- FLOW DIRECTION
- C COMPOST SOCK (2/5)
- HABITAT SENSITIVE AREA BOUNDARY (NOTE 3)
- STABILIZATION (SEE NOTE 6) (3/5)
- TC TRACKING CONTROLS (SEE NOTE 7)

NOTES

1. ALL PLANS IN THIS PLAN SET WERE DRAWN BASED ON THE FOLLOWING DATUM SOURCE:
   HORIZONTAL CONTROL - NAD83 ILLINOIS STATE PLANE EAST, U.S. feet
   VERTICAL CONTROL - NAVD 88., U.S. feet
2. EXISTING PHOTOGRAMMETRIC SURVEY DATA PROVIDED BY GEO TECH. FLIGHT DATE: 4 DECEMBER 2015.
3. EARTH DISTURBING ACTIVITIES ARE PROHIBITED OUTSIDE OF THE LIMITS OF DISTURBANCE.
4. DOWNGRADIENT PROTECTIVE MEASURES MUST BE IN PLACE PRIOR TO EARTH DISTURBANCES.
5. CONSTRUCTION SHOULD BE SEQUENCED SUCH THAT EXPOSED AREAS ARE LIMITED TO WHAT CAN BE STABILIZED PRIOR TO FORECAST RAIN.
6. STABILIZATION MEASURE MUST BE IMPLEMENTED WITHIN 1 WORKING DAY OF CESSATION OF EARTH DISTURBING ACTIVITIES, FOR PORTIONS OF THE SITE THAT HAVE REACHED FINAL GRADE OR WHERE CONSTRUCTION ACTIVITIES HAVE PERMANENTLY CEASED, AND COMPLETED WITHIN 14 DAYS.
7. STREET SWEEPING SHALL BE IMPLEMENTED AS NEEDED AT THE NEAREST PAVED SURFACE, APPROXIMATELY 1300-FT FROM CONSTRUCTION ACTIVITY.
8. CONTRACTOR SHALL COMPLY WITH REQUIREMENTS OF 'STORMWATER POLLUTION PREVENTION PLAN, EAST ASH BASIN SLOPE MODIFICATION' BY GEOSYNTEC, JULY 2016.

0 60' 120'
SCALE IN FEET

(1in) (2in) (3in) (4in)
SCALE IS BASED ON 22" X 34" NON-REDUCED SHEET SIZE (BORDER = 21" X 32")

ISSUED FOR BID

REV	DATE	DESCRIPTION	DRN	APP

Geosyntec consultants
3990 OLD TOWN AVENUE, SUITE A-101
SAN DIEGO, CA 92110
PHONE: 619.810.4000

TITLE: SWPPP

PROJECT: EAST ASH BASIN SLOPE MODIFICATION

SITE: WAUKEGAN GENERATING STATION
LAKE COUNTY, ILLINOIS

THIS DRAWING MAY NOT BE ISSUED FOR PROJECT TENDER OR CONSTRUCTION, UNLESS SEALED.

Jane Soule
SIGNATURE
7/1/16
DATE

JANE W. SOULE 062-067766 LICENSED PROFESSIONAL ENGINEER STATE OF ILLINOIS

DESIGN BY:	JG	DATE:	JULY 2016
DRAWN BY:	JA	PROJECT NO.:	SW0251-11
CHECKED BY:	GC	FILE:	SW0251-11-06
REVIEWED BY:	JS	DRAWING NO.:	6 OF 7
APPROVED BY:	JS		

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SURVEY CONTROL POINTS

PT NO.	NORTHING	EASTING	ELEV
100	2080081.36	1124398.00	604.00
101	2080072.25	1124397.50	604.19
102	2080066.08	1124397.19	603.33
103	2080033.65	1124398.72	583.40
104	2080087.98	1124407.11	603.00
105	2080068.79	1124408.21	603.00
106	2080036.43	1124414.03	583.40
107	2080101.42	1124428.72	599.40
108	2080071.84	1124434.52	600.00
109	2080039.57	1124440.76	583.40
110	2080101.02	1124444.16	599.52
111	2080078.27	1124451.51	600.00
112	2080047.90	1124464.91	583.40
113	2080105.13	1124466.59	599.57
114	2080083.99	1124471.13	600.00
115	2080051.53	1124478.09	583.40
116	2080107.88	1124481.58	599.55
117	2080084.37	1124483.01	600.00
118	2080051.09	1124489.55	583.40
119	2080112.86	1124510.84	599.60
120	2080093.64	1124515.78	600.00
121	2080060.84	1124520.90	583.40
122	2080120.84	1124543.90	599.63
123	2080102.49	1124547.18	600.00
124	2080070.12	1124554.54	583.40
125	2080138.95	1124584.79	599.31
126	2080103.78	1124595.75	600.00
127	2080069.83	1124603.94	582.60
128	2080113.78	1124620.67	600.00
129	2080082.40	1124635.73	582.60
130	2080154.39	1124615.57	599.23
131	2080122.89	1124638.85	600.00
132	2080094.66	1124659.61	582.60
133	2080167.03	1124633.47	599.36
134	2080144.24	1124656.14	600.00
135	2080119.32	1124680.43	582.60
136	2080184.50	1124652.60	599.33
137	2080159.01	1124676.65	600.00
138	2080137.02	1124704.92	582.60
139	2080209.88	1124675.70	599.46
140	2080197.56	1124699.83	600.00
141	2080181.73	1124730.88	582.60
142	2080255.71	1124703.37	599.62
143	2080249.34	1124721.36	600.00
144	2080237.38	1124754.04	582.60
145	2080284.53	1124717.03	599.69
146	2080280.35	1124731.84	600.00
147	2080270.89	1124765.33	582.60
148	2080322.19	1124730.64	599.71
149	2080317.74	1124744.37	600.00
150	2080307.02	1124777.48	582.60
151	2080351.75	1124740.47	599.72
152	2080346.98	1124753.72	600.00
153	2080335.21	1124786.47	582.60

PT NO.	NORTHING	EASTING	ELEV
154	2080379.65	1124752.08	599.74
155	2080374.25	1124764.16	600.00
156	2080361.52	1124796.55	582.60
157	2080410.64	1124761.84	599.72
158	2080406.61	1124775.44	600.00
159	2080396.74	1124808.81	582.60
160	2080446.96	1124773.99	599.70
161	2080442.02	1124788.33	600.00
162	2080430.67	1124821.23	582.60
163	2080495.87	1124789.90	599.63
164	2080476.01	1124839.43	582.60
165	2080488.99	1124807.05	600.00
166	2080517.66	1124796.42	599.61
167	2080511.62	1124814.96	600.00
168	2080500.83	1124848.07	582.60
169	2080548.62	1124804.88	599.61
170	2080543.36	1124823.44	600.00
171	2080533.87	1124856.92	582.60
172	2080591.08	1124819.10	599.65
173	2080585.43	1124835.48	600.00
174	2080576.30	1124869.06	582.60
175	2080612.22	1124825.36	599.67
176	2080608.01	1124841.09	600.00
177	2080599.61	1124874.87	582.60
178	2080646.78	1124834.29	599.64
179	2080640.97	1124851.38	600.00
180	2080631.45	1124884.87	582.60
181	2080667.10	1124840.80	599.67
182	2080662.01	1124856.75	600.00
183	2080653.40	1124890.47	582.60
184	2080684.90	1124847.68	599.68
185	2080681.74	1124863.52	600.00
186	2080671.00	1124896.63	582.60
187	2080723.78	1124860.22	599.70
188	2080714.72	1124873.38	600.00
189	2080704.88	1124906.76	582.60
190	2080751.18	1124870.99	599.75
191	2080746.65	1124882.79	600.00
192	2080734.17	1124915.27	582.60
193	2080785.20	1124883.14	599.73
194	2080779.79	1124895.56	600.00
195	2080765.90	1124927.46	582.60
196	2080811.48	1124891.47	599.67
197	2080806.25	1124907.08	600.00
198	2080791.67	1124938.69	582.60
199	2080837.64	1124900.56	599.63
200	2080825.88	1124915.65	600.00
201	2080811.02	1124947.12	582.60
202	2080868.55	1124915.15	599.63
203	2080859.71	1124931.63	600.00
204	2080844.85	1124963.10	582.60
205	2080900.45	1124937.39	599.65
206	2080881.52	1124944.75	600.00
207	2080859.48	1124971.68	582.60

PT NO.	NORTHING	EASTING	ELEV
208	2080910.75	1124943.66	599.61
209	2080897.09	1124957.50	600.00
210	2080875.04	1124984.43	582.60
211	2080929.94	1124965.68	599.68
212	2080919.62	1124977.96	600.00
213	2080892.35	1124999.58	582.60
214	2080962.13	1125005.97	599.62
215	2080945.99	1125015.91	600.00
216	2080916.36	1125034.16	582.60
217	2080984.92	1125036.30	599.56
218	2080970.60	1125054.50	600.00
219	2080947.16	1125082.42	582.60
220	2081000.35	1125051.10	599.46
221	2080977.71	1125065.76	600.00
222	2080954.57	1125096.01	582.60
223	2081011.89	1125064.39	599.43
224	2080990.03	1125084.39	600.00
225	2081000.04	1125090.47	600.00
226	2080975.23	1125117.45	582.60
227	2080987.80	1125123.13	582.60
228	2081015.31	1125095.09	600.00
229	2081006.42	1125128.75	582.60
230	2081030.06	1125075.92	599.56
231	2081045.21	1125080.97	599.59
232	2081046.14	1125101.99	600.00
233	2081039.38	1125136.13	582.60
234	2081070.37	1125080.32	599.49
235	2081064.50	1125105.23	600.00
236	2081059.28	1125139.65	582.60
237	2081083.36	1125077.08	600.00
238	2081081.49	1125109.79	600.02
239	2081079.32	1125142.19	582.60
240	2081091.91	1125074.28	601.00
241	2081097.13	1125073.74	602.00
242	2081099.55	1125114.69	601.00
243	2081115.13	1125115.22	603.00
244	2081116.09	1125119.17	601.90
245	2081114.11	1125144.19	582.60

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Geosyntec consultants
3990 OLD TOWN AVENUE, SUITE A-101
SAN DIEGO, CA 92110
PHONE: 619.810.4000

TITLE: SURVEY CONTROL POINTS

PROJECT: EAST ASH BASIN SLOPE MODIFICATION

SITE: WAUKEGAN GENERATING STATION
LAKE COUNTY, ILLINOIS

THIS DRAWING MAY NOT BE ISSUED FOR PROJECT TENDER OR CONSTRUCTION, UNLESS SEALED.

SIGNATURE

7/1/16
DATE

JANE W. SOULE
062-067768
LICENSED PROFESSIONAL ENGINEER
STATE OF ILLINOIS

DESIGN BY:	JG	DATE:	JULY 2016
DRAWN BY:	JA	PROJECT NO.:	SW0251-11
CHECKED BY:	GC	FILE:	SW0251-11-07
REVIEWED BY:	JS	DRAWING NO.:	7 OF 7
APPROVED BY:	JS		

ISSUED FOR BID

(3in)
(2in)
(1in)
(1in) (2in) (3in) (4in)
SCALE IS BASED ON 22" X 34" NON-REDUCED SHEET SIZE (BORDER = 21" X 32")

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APPENDIX B

Technical Specifications

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APPENDIX B-1

East Ash Basin Liner Replacement Specifications

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1.0 WORK INCLUDED

1.1 This work includes furnishing materials, tools, equipment, and labor to perform bulk and structural excavation, grading, dewatering and place and compact fill, backfill, and bedding materials.

1.2 Excavation includes, sheeting and bracing required for proper execution of the work, loosening, digging, wedging, ripping, loading, hauling, stockpiling, dumping, and disposal of excavated materials in legal disposal areas approved by Owner's Representative.

1.3 Excavation is unclassified and includes, but is not limited to soil, ash and rock materials, abandoned underground conduits or pipes, and buried concrete and masonry structures.

2.0 QUALITY CONTROL

2.1 Existing and new materials to be used as fill, backfill or bedding are subject to the approval of Owner's Representative.

2.2 Bottom ash from the site may be incorporated in the fill material if the Contractor provides tests results and a statement from a geotechnical engineer that use of the bottom ash in conjunction with the other proposed fill materials will not compromise the stability of the 2.5:1 slope.

2.3 To obtain approval of fill, backfill, and bedding materials, designate the proposed borrow area and notify the Owner's Site Representative for a visual inspection prior to placing the material.

3.0 REFERENCES

3.1 Occupational Safety and Health Administration (OSHA)

A. OSHA 2206 General Industry Standards

B. OSHA 2207 Construction Industry Standards

3.2 Illinois Department of Transportation (IDOT) - Standard Specifications for Road and Bridge Construction.

3.3 American Society for Testing and Materials (ASTM)

A. ASTM D 1556- Test for Density of Soil in place by Sand Cone Method

B. ASTM D 1557- Tests for Moisture-Density Relations of Soils Using 10 lb. Hammer and 18 inch drop.

C. ASTM D 2167- Test for Density of Soil in place by Rubber Balloon Method

3.4 The above references shall be the current revision for each.

4.0 SUBMITTALS

4.1 With Contractors' Proposals

A. Submit product data sheets for the chosen liner material.

B. Submit the estimated quantities of materials required to complete the work.

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4.2 Two weeks prior to the start of the work, submit to the Owner's Engineer for review, procedures for placing and compacting fill on top of the new liner without damaging the liner material. Include a statement from the liner manufacture that says the procedure is acceptable.

5.0 SITE CONDITIONS

5.1 Prior to start of work become thoroughly familiar with the site, site access, the site conditions, and all portions of the work.

5.2 One pond will be operational while the work on the second pond is being performed.

6.0 MATERIALS

6.1 Make maximum use of suitable on site material for fill when building the pond slopes and entrance ramps. Suitable on site fill material is granular soil or soil/rock mixture that is free from organic matter and other deleterious substances. Material containing rocks or lumps over 1½" in greatest dimension, or containing 15% rocks or lumps larger than ½" in greatest dimension is not acceptable. The material shall have an angle of repose of 30° or greater.

6.2 Imported fill and backfill material shall meet the requirements of Item 6.1 above and, in addition, shall contain predominantly granular material with a maximum particle size of 2".

6.3 Sand used as the protective layer for the pond liners shall be approved by the liner manufacturer.

6.4 Rip rap, coarse aggregate and limestone screenings shall comply with I.D.O.T. specifications.

7.0 BULK AND STRUCTURAL EXCAVATION

7.1 Perform bulk and structural excavation in accordance with the most recent revision of the OSHA General Industry Standards (OSHA 2206) and the OSHA Construction Industry Standards (OSHA 2207).

7.2 Provide temporary grading, ditches and other means as required to drain the areas of the work.

7.3 Perform excavation to lines and grades shown on the contract drawings and as directed by Owner's Representative.

7.4 When the sides of an excavation are five feet or more in depth or when employees are required to enter the excavated area where danger from moving ground exists, perform excavation by open cut to a stable slope or by sheeting and bracing.

7.5 Remove unstable subsoil material, where encountered at the bottom of excavation, to a depth required to obtain satisfactory bearing conditions. Contractor is responsible for bringing the excavation back to the proper elevation by installing compacted bedding material as specified in this section.

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7.6 Remove spoil from areas of excavation and stockpile for later use at locations no closer than 2'-0" from edge of excavation unless otherwise approved by Owner's Representative. Remove excess spoil and excavated materials not specifically approved by Owner's Representative for fill, backfill or stockpiling from the site and dispose of these materials at locations and in a manner approved by Federal, State and Local Authorities.

7.7 Properly grade bottom of bulk and structural excavations, remove loose materials, and maintain excavations in good condition, keeping them dry in accordance with Article 8.0 Dewatering, of this section, and free from debris, ice, and frost until completion of the work.

8.0 DEWATERING

8.1 Provide and maintain in operation adequate pumping capacity from sumps, deep wells, or well point installation and perform all other work necessary to keep excavations dry and free of groundwater or surface water during the progress of the work.

8.2 Construction is not permitted in flowing or standing water.

8.3 Dispose of water pumped or drained from the work area in a manner satisfactory to the Owner's Representative, without damage to adjacent property or to other work under construction.

8.4 Take necessary precautions to protect the work against flooding.

9.0 COMPACTION

9.1 Determine the types of equipment and the number of passes required to obtain the required compaction. A pass is defined as one complete coverage of the area by the compaction equipment being used.

9.2 Compact fill and backfill materials to a minimum of 90% of maximum dry density in all areas except in road areas where a minimum of 95% of maximum dry density is required.

9.3 Compact surfaces that are scarified along with and as part of the first lift of fill material that is spread thereon.

9.4 Maximum dry density is defined as the maximum density that can be produced when the same material is compacted in the laboratory in accordance with ASTM D 698 (Standard Proctor).

10.0 INSTALLATION OF FILL AND BACKFILL

10.1 Install fill and backfill material by placing fill and backfill material in uniform layers not to exceed 6" loose measurement unless otherwise noted on the contract drawings or elsewhere in this specification. Compact to minimum specified compaction as set forth in Article 9.2 of this Section.

10.2 Install the 12" protective sand layer on top of the liner material in a single layer.

10.3 Moisten and scarify surfaces to a depth of 4", against which new fill or roadway material is to be placed.

10.4 Remove shoring as backfill progresses only when banks are safe from caving or collapse.

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10.5 Water or aerate the material as necessary, and thoroughly mix to obtain a moisture content that will permit proper compaction.

10.6 Do not place fill or backfill materials on a frozen surface. Do not incorporate snow, ice or frozen earth with the fill. Distribute and grade fill and backfill materials throughout the work such that fill will be free from lenses, pockets, streaks or layers of materials differing in texture or gradation from the surrounding material. Do not place successive layers until the layer under construction has been satisfactorily compacted. Place materials in horizontal lifts.

10.7 Remove, dispose and replace any material that Owner's Representative considers objectionable without additional cost to Owner.

10.8 Bring subgrades to a plus or minus tolerance of 0.10 feet.

11.0 FIELD QUALITY CONTROL

11.1 Do not allow or cause any of the work performed or installed to be covered up or enclosed prior to required inspections, tests, and approvals.

11.2 Should any of the work be enclosed or covered up before it has been approved, uncover such work at no additional cost to Owner.

11.3 After the work has been completed, tested, inspected, and approved, make repairs and replacements necessary to restore the work to the condition in which it was found at the time of uncovering, at no additional cost to the Owner.

11.4 Owner may engage (at his own expense), a testing laboratory to inspect and perform tests on all fill, backfill, and bedding materials.

A. The testing laboratory shall conduct and interpret the following ASTM tests to determine the degree of compaction achieved by compaction operations:

1. ASTM D 1556 Test for Density of Soil in place by Sand Cone Method
2. ASTM D 2167 Test for Density of Soil in place by Rubber Balloon Method
3. ASTM D 2922 Test for Density of Soil in place by Nuclear Methods

B. The testing laboratory shall prepare a test report stating whether the test specimens comply with the work requirements, and specifically state any deviations therefrom.

C. Contractor shall provide access for Owner's testing personnel to all required areas so that required inspection and testing can be accomplished.

D. The Owner shall have the right to reject any materials or work not complying with the requirements of the Specification.

E. Contractor shall be responsible for all costs associated with the removal and replacement of all materials determined by Owner's testing personnel to have failed the testing acceptance standards.

END OF SECTION

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1.0 WORK INCLUDED

This work includes furnishing materials, tools, equipment, and labor to install a 60-mil thick, high-density polyethylene liner with a reflective white coating.

2.0 REFERENCES

2.1 American Society for Testing and Materials (ASTM)

- D 638 Standard Test Method for Tensile Properties of Plastics
- D 1004 Test Method for Initial Tear Resistance of Plastic Film and Sheeting
- D 1238 Standard Test Method for Flow Rates of Thermoplastics by Extrusion Plastometer
- D 1505 Test Method for Density of Plastics by the Density-Gradient Technique
- D 1603 Test Method for Carbon Black in Olefin Plastics
- D 3895 Standard Test Method for Oxidative-Induction Time of Polyolefins by Differential Scanning Calorimetry
- D 4833 Standard Test Method for Index Puncture Resistance of Geotextiles, Geomembranes, and Related Products
- D 5199 Standard Test Method for Measuring Nominal Thickness of Geotextiles and Geomembranes
- D 5397 Standard Test Method for Evaluation of Stress Crack Resistance of Polyolefin Geomembranes Using Notched Constant Tensile Load Test
- D 5596 Standard Test Method for Microscopic Evaluation of the Dispersion of Carbon Black in Polyolefin Geosynthetics
- D 6392 Standard Test Method for Determining the Integrity of Non-reinforced Geomembrane Seams Produced Using Thermo-Fusion Methods

2.2 Geosynthetic Research Institute

- GM9 Cold Weather Seaming of Geomembranes
- GM13 Test Properties, Testing Frequency and Recommended Warranty for High Density Polyethylene (HDPE) Smooth and Textured Geomembranes
- GM19 Seam Strength and Related Properties of Thermally Bonded Polyolefin Geomembranes

3.0 DEFINITIONS

3.1 Lot - A quantity of resin (usually the capacity of one rail car) used in the manufacture of polyethylene geomembrane rolls. The finished roll will be identified by a roll number traceable to the resin lot used.

3.2 Construction Quality Assurance Consultant (consultant) - Party, independent from manufacturer and installer that is responsible for observing and documenting activities related to quality assurance during the lining system construction.

3.3 Engineer - The individual or firm responsible for the design and preparation of the project's Contract Drawings and Specifications.

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3.4 Geomembrane Manufacturer (manufacturer) - The party responsible for manufacturing the geomembrane rolls.

3.5 Geosynthetic Quality Assurance Laboratory (testing laboratory) - Party, independent from the owner, manufacturer and installer, responsible for conducting laboratory tests on samples of geosynthetics obtained at the site or during manufacturing, usually under the direction of the owner.

3.6 Installer - Party responsible for field handling, transporting, storing, deploying, seaming and testing of the geomembrane seams.

3.7 Panel - Unit area of a geomembrane that will be seamed in the field that is larger than 100 square feet.

3.8 Patch - Unit area of a geomembrane that will be seamed in the field that is less than 100 square feet.

3.9 Subgrade Surface - Soil layer surface which immediately underlies the geosynthetic material.

4.0 SUBMITTALS POST-AWARD

4.1 Furnish the following product data, in writing, to engineer prior to installation of the geomembrane material:

A. Resin Data shall include certification stating that the resin meets the specification requirements (see Section 8.0).

B. Statement certifying no more than 10% reclaimed polymer (of the same type) is added to the resin (product run may be recycled) per GRI GM 13.

4.2 The installer shall furnish the following information to the engineer and owner prior to installation:

A. Installation layout drawings

1. Must show proposed panel layout including field seams and details

2. Must be approved prior to installing the geomembrane (Approved drawings will be for concept only and actual panel placement will be determined by site conditions).

B. Installer's Geosynthetic Field Installation Quality Assurance Plan

4.3 The installer will submit the following to the engineer upon completion of installation:

A. Certificate stating the geomembrane has been installed in accordance with the Contract Documents

B. Material and installation warranties

C. As-built drawings showing actual geomembrane placement and seams including typical anchor trench detail/

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5.0 QUALITY ASSURANCE

5.1 The Owner may engage and pay for the services of a Quality Assurance Consultant to monitor geomembrane installation.

5.2 Qualifications

A. Manufacturer

1. Geomembrane shall be manufactured by GSE Lining Technology, Inc. or an approved equal.

2. Manufacturer shall have manufactured a minimum of 10,000,000 square feet of polyethylene geomembrane during the last year.

B. Installer

1. The liner manufacturer shall install the liner.

2. Installer shall have installed a minimum of 3,000,000 square feet of HDPE geomembrane during the last five years.

3. Installer shall have worked in a similar capacity on at least three projects similar in complexity to the project described in the contract documents.

4. The Installation Supervisor shall have worked in a similar capacity on projects similar in size and complexity to the project described in the Contract Documents.

5. The installer shall provide a minimum of one Master Seamer for work on the project.

6. Must have completed a minimum of 1,000,000 square feet of geomembrane seaming work using the type of seaming apparatus proposed for the use on this Project.

6.0 MATERIAL LABELING, DELIVERY, STORAGE AND HANDLING

6.1 Labeling - Each roll of geomembrane delivered to the site shall be labeled by the manufacturer. The label will identify:

A. Manufacturer's name

B. Product identification

C. Roll number

6.2 Delivery - Rolls of liner will be prepared to ship by appropriate means to prevent damage to the material and to facilitate off-loading.

6.3 Storage - The on-site storage location for geomembrane material, provided by the contractor to protect the geomembrane from punctures, abrasions and excessive dirt and moisture for should have the following characteristics:

A. Level (no wooden pallets)

B. Smooth

C. Dry

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D. Protected from theft and vandalism

E. Adjacent to the area being lined

6.4 Handling - Materials are to be handled so as to prevent damage.

7.0 WARRANTY

7.1 Material shall be warranted, on a pro-rata basis against Manufacturer's defects for a period of five years from the date of geomembrane installation.

7.2 Installation shall be warranted against defects in workmanship for a period of one year from the date of geomembrane completion.

8.0 GEOMEMBRANE

8.1 Material shall be smooth/textured polyethylene geomembrane as shown on the drawings.

8.2 Resin

A. Resin shall be new, first quality, compounded and manufactured specifically for producing geomembrane.

B. Natural resin (without carbon black) shall meet the following additional minimum requirements:

Property	**Test Method**[1]	**HDPE**
Density [g/cm^3]	ASTM D 1505	0.932
Melt Flow Index [g/10 min.]	ASTM D 1238 (190/2.16)	≤ 1.0
OIT [minutes]	ASTM D 3895 (1 atm/200°C)	100

8.3 Geomembrane Rolls

A. Do not exceed a combined maximum total of one percent by weight of additives other than carbon black.

B. Geomembrane shall be free of holes, pinholes as verified by on-line electrical detection, bubbles, blisters, excessive contamination by foreign matter, and nicks and cuts on roll edges.

C. Geomembrane material is to be supplied in roll form. Each roll is to be identified with labels indicating both number, thickness, length, width and manufacturer.

D. All liner sheets produced at the factory shall be inspected prior to shipment for compliance with the physical property requirements listed in Section 8.2, and be tested by an acceptable method of inspecting for pinholes. If pinholes are located, identified and indicated during manufacturing, these pinholes may be corrected during installation.

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8.4 Smooth, white surfaced geomembrane shall meet the requirements shown in Table 1.2

The geomembrane shall be a white-surfaced, coextruded geomembrane. The white surface shall be installed upwards.

8.5 Extrudate Rod or Bead

A. Extrudate material shall be made from same type resin as the geomembrane.

B. Additives shall be thoroughly dispersed.

C. Materials shall be free of contamination by moisture or foreign matter.

9.0 EQUIPMENT

Welding equipment and accessories shall meet the following requirements:

9.1 Gauges showing temperatures in apparatus (extrusion welder) or wedge (wedge welder) shall be present.

9.2 An adequate number of welding apparatus shall be available to avoid delaying work.

9.3 Power source capable of providing constant voltage under combined line load shall be used.

10.0 DEPLOYMENT

10.1 Assign each panel a simple and logical identifying code. The coding system shall be subject to approval and shall be determined at the job site.

10.2 Visually inspect the geomembrane during deployment for imperfections and mark faulty or suspect areas.

10.3 Deployment of geomembrane panels shall be performed in a manner that will comply with the following guidelines:

A. Unroll geomembrane panels using methods that will not damage geomembrane and will protect underlying surface from damage (i.e., spreader bar, protected equipment bucket).

B. Place ballast (commonly sandbags) on geomembrane that will not damage geomembrane to prevent wind uplift.

C. Personnel walking on geomembrane shall not engage in activities or wear shoes that could damage the geomembrane. Smoking will not be permitted on the geomembrane.

D. Do not allow heavy vehicular traffic directly on geomembrane. Rubber-tired ATV's and trucks are acceptable if wheel contact is less than six psi.

E. Protect geomembrane in areas of heavy traffic by placing protective cover over the geomembrane.

10.4 Sufficient material (slack) shall be provided to allow for thermal expansion and contraction of the material.

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11.0 FIELD SEAMING

11.1 Seams shall meet the following requirements:

A. To the maximum extent possible, orient seams parallel to line of slope, i.e., down and not across slope.

B. Minimize number of field seams in corners, odd shaped geometric locations and outside corners.

C. Slope seams (panels) shall extend a minimum of five-feet beyond the grade break into the flat area.

D. Use a sequential seam numbering system compatible with panel numbering system that is agreeable to the consultant and installer.

E. Align seam overlaps consistent with the requirements of the welding equipment being used. A six-inch overlap is commonly suggested.

11.2 During Welding Operations provide at least one Master Seamer who shall provide direct supervision over other welders as necessary.

11.3 Extrusion Welding

A. Hot-air tack adjacent pieces together using procedures that do not damage geomembrane.

B. Clean geomembrane surfaces by disc grinder or equivalent.

C. Purge welding apparatus of heat degraded extrudate before welding.

11.4 Hot Wedge Welding

A. Welding apparatus shall be a self-propelled device equipped with an electronic controller that displays applicable temperatures.

B. Clean seam area of dust, mud, moisture and debris immediately ahead of the hot wedge welder.

C. Protect against moisture build up between sheets.

12.0 Trial Welds

A. Perform trial welds on geomembrane samples to verify welding equipment is operating properly.

B. Make trial welds under the same surface and environmental conditions as the production welds, i.e., in contact with subgrade and similar ambient temperature.

C. Minimum of two trial welds per day, per welding apparatus, one made prior to the start of work and one completed at mid shift.

D. Cut four, one-inch wide by six-inch long test strips from the trial weld.

E. Quantitatively test specimens for peel adhesion, and then for bonded seam strength (shear).

F. Trial weld specimens shall pass when the results shown in Table 3 are achieved in both peel and shear test.

1. The break, when peel testing, occurs in the liner material itself, not through peel separation (FTB).

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2. The break is ductile.

G. Repeat the trial weld, in its entirety, when any of the trial weld samples fail in either peel or shear.

H. No welding equipment or welder shall be allowed to perform production welds until equipment and welders have successfully completed trial weld.

12.2 Seaming shall not proceed when ambient air temperature or adverse weather conditions jeopardize the integrity of the liner installation. Installer shall demonstrate that acceptable seaming can be performed by completing acceptable trial welds.

12.3 Defects and Repairs

A. Examine all seams and non-seam areas of the geomembrane for defects, holes, blisters, undispersed raw materials, and any sign of contamination by foreign matter.

B. Repair and non-destructively test each suspect location in both seam and non-seam areas. Do not cover geomembrane at locations that have been repaired until test results with passing values are available.

13.0 FIELD QUALITY ASSURANCE

13.1 Manufacturer/installer shall participate in and conform to all terms and requirements of the Owner's quality assurance program. Contractor shall be responsible for assuring this participation.

13.2 Field Testing

A. Non-destructive testing shall be carried out as the seaming progresses.

1. Vacuum Testing - Shall be performed in accordance with ASTM D 5641, Standard Practice for Geomembrane Seam Evaluation by Vacuum Chamber.

2. Air Pressure Testing - Shall be performed in accordance with ASTM D 5820, Standard Practice for Pressurized Air Channel Evaluation of Dual Seamed Geomembranes.

13.3 Destructive Testing (performed by the installer witnessed by the consultant)

A. Location and Frequency of Testing

1. Collect destructive test samples at a frequency of one per every 1500 lineal feet of seam length.

2. Test locations will be determined after seaming.

3. Exercise Method of Attributes as described by GRI GM-14 (Geosynthetics Institute, http://www.geosynthetic-institute.org) to minimize test samples taken.

B. Sampling Procedures are performed as follows:

1. Installer shall cut samples at locations designated by the consultant as the seaming progresses in order to obtain field laboratory test results before the geomembrane is covered.

2. Consultant will number each sample, and the location will be noted on the installation as built.

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3. Samples shall be twelve inches wide by minimal length with the seam centered lengthwise.
4. Cut a two-inch wide strip from each end of the sample for field-testing.
5. Cut the remaining sample into two parts for distribution as follows:
   a. One portion for installer, twelve -inches by twelve inches
   b. One portion for the third party laboratory, 12-inches by 18-inches
   c. Additional samples may be archived if required.

C. Destructive testing shall be performed in accordance with ASTM D 6392, Standard Test Method for Determining the Integrity of Non-Reinforced Geomembrane Seams Produced Using Thermo-Fusion Methods.

D. Installer shall repair all holes in the geomembrane resulting from destructive sampling.

E. Repair and test the continuity of the repair in accordance with these Specifications.

13.4 Failed Seam Procedures

A. If the seam fails, installer shall follow one of two options:
   1. Reconstruct the seam between any two passed test locations.
   2. Trace the weld to an intermediate location at least ten feet minimum or to where the seam ends in both directions from the location of the failed test.

B. The next seam welded using the same welding device is required to obtain an additional sample, i.e., if one side of the seam is less than ten feet long.

C. If sample passes, then the seam shall be reconstructed or capped between the test sample locations.

D. If any sample fails, the process shall be repeated to establish the zone in which the seam shall be reconstructed.

14.0 REPAIR PROCEDURES

14.1 Remove damaged geomembrane and replace with acceptable geomembrane materials if damage cannot be satisfactorily repaired.

14.2 Repair any portion of unsatisfactory geomembrane or seam area failing a destructive or non-destructive test.

14.3 Installer shall be responsible for repair of defective areas.

14.4 Agreement upon the appropriate repair method shall be decided between consultant and installer by using one of the following repair methods:

A. Patching - Used to repair large holes, tears, undispersed raw materials and contamination by foreign matter.

B. Abrading and Rewelding - Used to repair short section of a seam.

C. Spot Welding - Used to repair pinholes or other minor, localized flaws or where geomembrane thickness has been reduced.

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D. Capping - Used to repair long lengths of failed seams.

E. Flap Welding - Used to extrusion weld the flap (excess outer portion) of a fusion weld in lieu of a full cap.

F. Remove the unacceptable seam and replace with new material.

14.5 The following procedures shall be observed when a repair method is used:

A. All geomembrane surfaces shall be clean and dry at the time of repair.

B. Surfaces of the polyethylene that are to be repaired by extrusion welds shall be lightly abraded to assure cleanliness.

C. Extend patches or caps at least six inches for extrusion welds and four inches for wedge welds beyond the edge of the defect, and around all corners of patch material.

14.6 Repair Verification

A. Number and log each patch repair (performed by consultant).

B. Non-destructively test each repair using methods specified in this Specification.

Table 3.1: Minimum Weld Values for Smooth HDPE Geomembranes

Property	**Test Method**	**60 (1.5)**
Peel Strength (fusion), ppi (kN/m)	ASTM D 6392	98 (17)
Peel Strength (extrusion), ppi (kN/m)	ASTM D 6392	78 (14)
Shear Strength (fusion & ext.), ppi (kN/m)	ASTM D 6392	121 (21)

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Table 1.2: Minimum Values for Smooth White-Surfaced HDPE Geomembranes

Property	Test Method	
Thickness, mil (mm)	ASTM D 5199	
Minimum Average		60 (1.5)
Lowest Individual Reading		54 (1.4)
Density, g/cm^3	ASTM D 1505	0.94
Carbon Black Content[(2)], %	ASTM D 1603	2.0
Carbon Black Dispersion	ASTM D 5596	*Note 3*
Tensile Properties:	ASTM D 638	
(each direction)	Type IV, 2 ipm	
Strength at Yield, lb/in (kN/m)		130 (23)
Strength at Break, lb/in (kN/m)		243 (43)
Elongation at Yield, %	(1.3" gauge length)	13
Elongation at Break, %	(2.0" gauge length)	700
Tear Resistance, lb (N)	ASTM D 1004	42 (187)
Puncture Resistance, lb (N)	ASTM D 4833	119 (530)
Notched Constant Tensile Load, hours	ASTM D 5397,	400
Oxidative Induction Time, min.	ASTM D 3895	100

Geomenbrane may have an overall ash content greater than 3.0% due to the white layer.

The OIT values apply to the black layer only.

Only near spherical agglomerates are considered. 9 of 10 views shall be Category 1 or 2. No more than one view Category 3.

END OF SECTION

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1.0 SCOPE OF WORK

1.1 The work to be performed under this section of the specification shall consist of furnishing all necessary supervision, materials, labor, and equipment to design a shotcrete mix, prepare the surface and install the repair/wear layer on the ash pond inlet structures as specified herein.

1.2 Shotcrete Mix: The shotcrete mix selected by the contractor shall be designed to minimize shrinkage cracking and to provide an abrasion resistant surface.

A. Option 1: Use a mix design of Portland cement, hard natural aggregates and admixtures that data and references show to be abrasion resistant.

B. Option 2: Incorporate silica fume into the mix design at a rate of not less than 4%.

2.0 REFERENCES

2.1 American Concrete Institute

A. ACI 308 Standard Practice for Curing Concrete

B. ACU 506R Guide to Shotcreting

C. ACI 506.2 Specification for Shotcrete

2.2 American Society for Testing and Materials

A. ASTM C33 Standard Specification for Concrete Aggregates

B. ASTM C150 Standard Specification for Portland Cement

C. ASTM C309 Standard Specification for Liquid Membrane Forming Compounds for Curing Concrete

D. ASTM C685 Standard Specification for Concrete Made by Volumetric Batching and Continuous Mixing

E. ASTM C1116 Standard Specification for Fiber Reinforced Concrete and Shotcrete

3.0 MATERIALS

3.1 Cement: Portland Cement conforming to ASTM C150 Type I.

3.2 Aggregate: Shall conform to ASTM C33.

3.3 Mixing Water: Shall conform to the requirements of ASTM C-94.

3.4 Silica Fume: "Force 10,000D" microsilica as manufactured by W.R. Grace or an approved equal.

3.5 Synthetic Reinforcing Fibers: "Strux 85/50" fibers as manufactured by W.R. Grace or an approved equal.

3.6 Curing Compounds: Wax based (Type I) or water emulsified, resin base (Type II)

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4.0 SUBMITTALS

4.1 The contractors shall submit the proposed mix designs and test data with their proposal. If test data is not available prior to award, the contractor shall be responsible for performing preconstruction testing of the mix after award. The mix shall have a 28-day strength of not less than 6,000 psi.

4.2 Two weeks before starting the shotcreting work, the contractor shall submit the qualifications of the nozzlemen who will be performing the work. Every nozzelman shall be certified and have a minimum of 3000 hours of experience as a nozzleman.

5.0 SURFACE PREPARATION

5.1 Inspect surfaces and conditions where shotcrete is to be placed. Notify the Owner's Representative immediately of any unsatisfactory conditions and do not proceed until those unsatisfactory conditions have been corrected.

5.2 Remove previously applied patching materials.

5.3 Chip or scarify the edges of the eroded areas of the concrete slab such that the change in thickness of the shotcrete application will be no greater than … per linear foot. Scarify the remainder of the existing structure to allow for a minimum shotcrete application of —", Taper edges to leave no square shoulders at the perimeter of a cavity. Perform these procedures with equipment and in a manner that leaves the maximum reveal to insure excellent bonding.

5.4 Inspect the surface upon completing the scarifying to insure no residual fractured fragments from the scarifying process remain.

5.5 Thoroughly clean the surfaces to be repaired by water blasting to remove any traces of dirt, dust, grease, oil or other substances that could effect the bond of the shotcrete to the existing concrete.

5.6 Adequately saturate the repair surface before beginning the shotcreting process.

6.0 INSTALLATION

6.1 Shotcrete shall be applied using the dry mix process.

6.2 Batching and Mixing:

A. Materials shall be volume proportioned by a calibrated screw conveyor or other approved methods.

B. Batching tolerances shall not exceed 1% for water, 1% for cementitious materials, 2% for sand and coarse aggregates and 3% for reinforcing fibers.

C. The percentage of surface moisture in the sand shall be maintained within 3% to 6% by weight.

D. Shotcrete batches that have been in contact with damp aggregate or other moisture for more than two hours shall be wasted at the contractor's expense.

E. Mixers for the mixing the dry ingredients shall be capable of mixing and discharging a uniform product without segregation of ingredients.

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F. The discharge nozzle of the applicator shall be equipped with a manual water injection system capable of ready adjustment and convenient to the nozzleman.

6.3 Placing of Shotcrete:

A. Shotcrete shall be placed, starting at the bottom of the Work and proceeding upward, using nozzles and air compressors capable of supplying clean and dry air adequate for maintaining uniform and sufficient nozzle velocity for the Work.

B. The minimum thickness of shotcrete shall be — in. per layer. The maximum total thickness shall not exceed 3" per layer, unless otherwise indicated on the Contract Drawings.

C. The surface of freshly placed shotcrete shall be broomed or cleaned to remove laitance. Shotcrete shall be placed in one layer; where shotcrete is placed over existing cementitious surfaces, such surfaces shall be dampened prior to application of the new shotcrete.

D. The finished repair surface shall not very from smooth by more than +/- ..." within any ten feet.

E. Fill corners filled first with sound material so as to prevent rebound collecting therein. Corners, or any area where rebound cannot easily escape or be blown out, are the most likely places for "sand pockets" to develop.

F. If placement results in sagging or sloughing off of materials, shotcreting shall be halted until causes have been determined and corrections have been made. If wind or air currents cause separation of nozzle stream during placement, or if rain occurs and it may wash cement out of the freshly placed material, shotcreting shall be discontinued or suitable means shall be provided to eliminate the problem. Shotcreting shall not be performed when ambient temperature is below 40°F at the pump or at the placement area.

G. The contractor shall provide and maintain sufficient standby equipment to assure continuous production and application of shotcrete.

6.4 All construction, placement and other joints shall be tapered with a height of at least twice the shotcrete thickness.

6.5 Any placed shotcrete which is damaged, or lacks uniformity, exhibits segregation, honeycomb or lamination, or contains dry patches, slugs, voids or sand pockets, shall be removed and replaced with dry mixed mortar.

6.6 Under no circumstances shall any rebound or previously expended material be used in the shotcrete mix.

6.7 Curing:

A. Curing shall commence immediately after the concrete has attained enough set to prevent damage to the concrete surface. Water curing shall be continued for seven days after shotcreting. During this curing period, the shotcrete work shall be maintained above 50°F.

B. After water curing, final curing may be performed by apply curing compounds. The rate of application shall be at least twice that recommended by the manufacturer for smooth concrete surfaces.

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7.0 INSPECTION AND TESTING

7.1 Contractor shall be responsible for all inspection and testing work as required or as needed, unless otherwise indicated. Owner's Representative may, during the course of the Work, observe the various phases of the Work for full compliance with all requirements of this Specification and the Contract Drawings. Any work failing to meet the specified requirements shall be rectified or replaced by Contractor at his expense at no additional cost to Owner.

7.2 Test Specimens:

A. Test specimens shall be made by each shotcrete application crew using the materials, equipment, and mix proportions used for the subject work.

B. A test panel of at least 30" x 30" shall be made with suitable backing material for each mix design being considered, and also for each shooting position to be encountered in the Work (i.e., horizontal, vertical and overhead positions). At least half of each panel to be tested for proper embedment of reinforcement shall contain the same reinforcement as the structure. The thickness of test panels shall be the same as the structure.

C. At least five cores shall be taken from each test panel for testing. All cored surfaces shall be dense and free from laminations and sand pockets. Embedment of reinforcement shall be examined in each panel.

7.3 Test specimens shall be obtained and tested in accordance with ASTM C42 and C39 for compressive strength only.

END OF SECTION

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APPENDIX B-2

West Ash Basin Liner Replacement Specifications

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1.0 WORK INCLUDED

1.1 This work includes furnishing materials, tools, equipment, and labor to perform bulk and structural excavation, grading, dewatering and place and compact fill, backfill, and bedding materials.

1.2 Excavation includes, sheeting and bracing required for proper execution of the work, loosening, digging, wedging, ripping, loading, hauling, stockpiling, dumping, and disposal of excavated materials in legal disposal areas approved by Owner's Representative.

1.3 Excavation is unclassified and includes, but is not limited to soil, ash and rock materials, abandoned underground conduits or pipes, and buried concrete and masonry structures.

2.0 QUALITY CONTROL

2.1 Existing and new materials to be used as fill, backfill or bedding are subject to the approval of Owner's Representative.

2.2 To obtain approval of fill, backfill, and bedding materials, designate the proposed borrow area and notify the Owner's Site Representative for a visual inspection prior to placing the material.

3.0 REFERENCES

3.1 Occupational Safety and Health Administration (OSHA)

A. OSHA 2206 General Industry Standards

B. OSHA 2207 Construction Industry Standards

3.2 Illinois Department of Transportation (IDOT) - Standard Specifications for Road and Bridge Construction.

3.3 American Society for Testing and Materials (ASTM)

A. ASTM D 1556- Test for Density of Soil in place by Sand Cone Method

B. ASTM D 1557- Tests for Moisture-Density Relations of Soils Using 10 lb. Hammer and 18 inch drop.

C. ASTM D 2167- Test for Density of Soil in place by Rubber Balloon Method

3.4 The above references shall be the current revision for each.

4.0 SUBMITTALS

4.1 With Contractors' Proposals

A. Submit product data sheets for the chosen liner material.

B. Submit the estimated quantities of materials required to complete the work.

4.2 Two weeks prior to the start of the work, submit to the Owner's Engineer for review, procedures for placing and compacting fill on top of the new liner without damaging the liner material. Include a statement from the liner manufacture that says the procedure is acceptable.

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5.0 SITE CONDITIONS

5.1 Prior to start of work become thoroughly familiar with the site, site access, the site conditions, and all portions of the work.

5.2 One pond will be operational while the work on the second pond is being performed.

6.0 MATERIALS

6.1 Make maximum use of suitable on site material for fill when building the pond slopes and entrance ramps. Suitable on site fill material is granular soil or soil/rock mixture that is free from organic matter and other deleterious substances. Material containing rocks or lumps over 1½" in greatest dimension, or containing 15% rocks or lumps larger than ½" in greatest dimension is not acceptable. The material shall have an angle of repose of 30° or greater.

6.2 Imported fill and backfill material shall meet the requirements of Item 6.1 above and, in addition, shall contain predominantly granular material with a maximum particle size of 2".

6.3 Sand used as the protective layer for the pond liners shall be approved by the liner manufacturer.

6.4 Rip rap, coarse aggregate and limestone screenings shall comply with I.D.O.T. specifications.

7.0 BULK AND STRUCTURAL EXCAVATION

7.1 Perform bulk and structural excavation in accordance with the most recent revision of the OSHA General Industry Standards (OSHA 2206) and the OSHA Construction Industry Standards (OSHA 2207).

7.2 Provide temporary grading, ditches and other means as required to drain the areas of the work.

7.3 Perform excavation to lines and grades shown on the contract drawings and as directed by Owner's Representative.

7.4 When the sides of an excavation are five feet or more in depth or when employees are required to enter the excavated area where danger from moving ground exists, perform excavation by open cut to a stable slope or by sheeting and bracing.

7.5 Remove unstable subsoil material, where encountered at the bottom of excavation, to a depth required to obtain satisfactory bearing conditions. Contractor is responsible for bringing the excavation back to the proper elevation by installing compacted bedding material as specified in this section.

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7.6 Remove spoil from areas of excavation and stockpile for later use at locations no closer than 2'-0" from edge of excavation unless otherwise approved by Owner's Representative. Remove excess spoil and excavated materials not specifically approved by Owner's Representative for fill, backfill or stockpiling from the site and dispose of these materials at locations and in a manner approved by Federal, State and Local Authorities.

7.7 Properly grade bottom of bulk and structural excavations, remove loose materials, and maintain excavations in good condition, keeping them dry in accordance with Article 8.0 Dewatering, of this section, and free from debris, ice, and frost until completion of the work.

8.0 DEWATERING

8.1 Provide and maintain in operation adequate pumping capacity from sumps, deep wells, or well point installation and perform all other work necessary to keep excavations dry and free of groundwater or surface water during the progress of the work.

8.2 Construction is not permitted in flowing or standing water.

8.3 Dispose of water pumped or drained from the work area in a manner satisfactory to the Owner's Representative, without damage to adjacent property or to other work under construction.

8.4 Take necessary precautions to protect the work against flooding.

9.0 COMPACTION

9.1 Determine the types of equipment and the number of passes required to obtain the required compaction. A pass is defined as one complete coverage of the area by the compaction equipment being used.

9.2 Compact fill and backfill materials to a minimum of 90% of maximum dry density in all areas except in road areas where a minimum of 95% of maximum dry density is required.

9.3 Compact surfaces that are scarified along with and as part of the first lift of fill material that is spread thereon.

9.4 Maximum dry density is defined as the maximum density that can be produced when the same material is compacted in the laboratory in accordance with ASTM D 698 (Standard Proctor).

10.0 INSTALLATION OF FILL AND BACKFILL

10.1 Install fill and backfill material by placing fill and backfill material in uniform layers not to exceed 6" loose measurement unless otherwise noted on the contract drawings or elsewhere in this specification. Compact to minimum specified compaction as set forth in Article 9.2 of this Section.

10.2 Install the 12" protective sand layer on top of the liner material in a single layer.

10.3 Moisten and scarify surfaces to a depth of 4", against which new fill or roadway material is to be placed.

10.4 Remove shoring as backfill progresses only when banks are safe from caving or collapse.

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10.5 Water or aerate the material as necessary, and thoroughly mix to obtain a moisture content that will permit proper compaction.

10.6 Do not place fill or backfill materials on a frozen surface. Do not incorporate snow, ice or frozen earth with the fill. Distribute and grade fill and backfill materials throughout the work such that fill will be free from lenses, pockets, streaks or layers of materials differing in texture or gradation from the surrounding material. Do not place successive layers until the layer under construction has been satisfactorily compacted. Place materials in horizontal lifts.

10.7 Remove, dispose and replace any material that Owner's Representative considers objectionable without additional cost to Owner.

10.8 Bring subgrades to a plus or minus tolerance of 0.10 feet.

11.0 FIELD QUALITY CONTROL

11.1 Do not allow or cause any of the work performed or installed to be covered up or enclosed prior to required inspections, tests, and approvals.

11.2 Should any of the work be enclosed or covered up before it has been approved, uncover such work at no additional cost to Owner.

11.3 After the work has been completed, tested, inspected, and approved, make repairs and replacements necessary to restore the work to the condition in which it was found at the time of uncovering, at no additional cost to the Owner.

11.4 Contractor shall engage a testing laboratory to inspect and perform tests on all fill, backfill, and bedding materials.

A. The testing laboratory shall conduct and interpret the following ASTM tests to determine the degree of compaction achieved by compaction operations:

1.	ASTM D 1556	Test for Density of Soil in place by Sand Cone Method
2.	ASTM D 2167	Test for Density of Soil in place by Rubber Balloon Method
3.	ASTM D 2922	Test for Density of Soil in place by Nuclear Methods

B. The testing laboratory shall prepare a test report stating whether the test specimens comply with the work requirements, and specifically state any deviations therefrom.

C. The Owner shall have the right to reject any materials or work not complying with the requirements of the Specification.

D. Contractor shall be responsible for all costs associated with the removal and replacement of all materials determined by testing personnel to have failed the testing acceptance standards.

END OF SECTION

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1.0 WORK INCLUDED

This work includes furnishing materials, tools, equipment, and labor to install a 60-mil thick. high-density polyethylene liner with a reflective white coating.

2.0 REFERENCES

2.1 American Society for Testing and Materials (ASTM)

- D 638 Standard Test Method for Tensile Properties of Plastics
- D 1004 Test Method for Initial Tear Resistance of Plastic Film and Sheeting
- D 1238 Standard Test Method for Flow Rates of Thermoplastics by Extrusion Plastometer
- D 1505 Test Method for Density of Plastics by the Density-Gradient Technique
- D 1603 Test Method for Carbon Black in Olefin Plastics
- D 3895 Standard Test Method for Oxidative-Induction Time of Polyolefins by Differential Scanning Calorimetry
- D 4833 Standard Test Method for Index Puncture Resistance of Geotextiles, Geomembranes, and Related Products
- D 5199 Standard Test Method for Measuring Nominal Thickness of Geotextiles and Geomembranes
- D 5397 Standard Test Method for Evaluation of Stress Crack Resistance of Polyolefin Geomembranes Using Notched Constant Tensile Load Test
- D 5596 Standard Test Method for Microscopic Evaluation of the Dispersion of Carbon Black in Polyolefin Geosynthetics
- D 6392 Standard Test Method for Determining the Integrity of Non-reinforced Geomembrane Seams Produced Using Thermo-Fusion Methods

2.2 Geosynthetic Research Institute

- GM9 Cold Weather Seaming of Geomembranes
- GM13 Test Properties, Testing Frequency and Recommended Warranty for High Density Polyethylene (HDPE) Smooth and Textured Geomembranes
- GM19 Seam Strength and Related Properties of Thermally Bonded Polyolefin Geomembranes

3.0 DEFINITIONS

3.1 Lot - A quantity of resin (usually the capacity of one rail car) used in the manufacture of polyethylene geomembrane rolls. The finished roll will be identified by a roll number traceable to the resin lot used.

3.2 Construction Quality Assurance Consultant (consultant) - Party, independent from manufacturer and installer that is responsible for observing and documenting activities related to quality assurance during the lining system construction.

3.3 Engineer - The individual or firm responsible for the design and preparation of the project's Contract Drawings and Specifications.

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3.4 Geomembrane Manufacturer (manufacturer) - The party responsible for manufacturing the geomembrane rolls.

3.5 Geosynthetic Quality Assurance Laboratory (testing laboratory) - Party, independent from the owner, manufacturer and installer, responsible for conducting laboratory tests on samples of geosynthetics obtained at the site or during manufacturing, usually under the direction of the owner.

3.6 Installer - Party responsible for field handling, transporting, storing, deploying, seaming and testing of the geomembrane seams.

3.7 Panel - Unit area of a geomembrane that will be seamed in the field that is larger than 100 square feet.

3.8 Patch - Unit area of a geomembrane that will be seamed in the field that is less than 100 square feet.

3.9 Subgrade Surface - Soil layer surface which immediately underlies the geosynthetic material.

4.0 SUBMITTALS POST-AWARD

4.1 Furnish the following product data, in writing, to engineer prior to installation of the geomembrane material:

A. Resin Data shall include certification stating that the resin meets the specification requirements (see Section 8.0).

B. Statement certifying no more than 10% reclaimed polymer (of the same type) is added to the resin (product run may be recycled) per GRI GM 13.

4.2 The installer shall furnish the following information to the engineer and owner prior to installation:

A. Installation layout drawings

1. Must show proposed panel layout including field seams and details

2. Must be approved prior to installing the geomembrane (Approved drawings will be for concept only and actual panel placement will be determined by site conditions).

B. Installer's Geosynthetic Field Installation Quality Assurance Plan

4.3 The installer will submit the following to the engineer upon completion of installation:

A. Certificate stating the geomembrane has been installed in accordance with the Contract Documents

B. Material and installation warranties

C. As-built drawings showing actual geomembrane placement and seams including typical anchor trench detail/

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5.0 QUALITY ASSURANCE

5.1 The Contractor shall engage and pay for the services of a Quality Assurance Consultant to monitor geomembrane installation.

5.2 Qualifications

A. Manufacturer

1. Geomembrane shall be manufactured by GSE Lining Technology, Inc. or an approved equal.

2. Manufacturer shall have manufactured a minimum of 10,000,000 square feet of polyethylene geomembrane during the last year.

B. Installer

1. The liner manufacturer shall install the liner.

2. Installer shall have installed a minimum of 3,000,000 square feet of HDPE geomembrane during the last five years.

3. Installer shall have worked in a similar capacity on at least three projects similar in complexity to the project described in the contract documents.

4. The Installation Supervisor shall have worked in a similar capacity on projects similar in size and complexity to the project described in the Contract Documents.

5. The installer shall provide a minimum of one Master Seamer for work on the project.

6. Must have completed a minimum of 1,000,000 square feet of geomembrane seaming work using the type of seaming apparatus proposed for the use on this Project.

6.0 MATERIAL LABELING, DELIVERY, STORAGE AND HANDLING

6.1 Labeling - Each roll of geomembrane delivered to the site shall be labeled by the manufacturer. The label will identify:

A. Manufacturer's name

B. Product identification

C. Roll number

6.2 Delivery - Rolls of liner will be prepared to ship by appropriate means to prevent damage to the material and to facilitate off-loading.

6.3 Storage - The on-site storage location for geomembrane material, provided by the contractor to protect the geomembrane from punctures, abrasions and excessive dirt and moisture for should have the following characteristics:

A. Level (no wooden pallets)

B. Smooth

C. Dry

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D. Protected from theft and vandalism

E. Adjacent to the area being lined

6.4 Handling - Materials are to be handled so as to prevent damage.

7.0 WARRANTY

7.1 Material shall be warranted, on a pro-rata basis against Manufacturer's defects for a period of five years from the date of geomembrane installation.

7.2 Installation shall be warranted against defects in workmanship for a period of one year from the date of geomembrane completion.

8.0 GEOMEMBRANE

8.1 Material shall be smooth/textured polyethylene geomembrane as shown on the drawings.

8.2 Resin

A. Resin shall be new, first quality, compounded and manufactured specifically for producing geomembrane.

B. Natural resin (without carbon black) shall meet the following additional minimum requirements:

Property	**Test Method[(1)]**	**HDPE**
Density [g/cm^3]	ASTM D 1505	0.932
Melt Flow Index [g/10 min.]	ASTM D 1238 (190/2.16)	≤ 1.0
OIT [minutes]	ASTM D 3895 (1 atm/200°C)	100

8.3 Geomembrane Rolls

A. Do not exceed a combined maximum total of one percent by weight of additives other than carbon black.

B. Geomembrane shall be free of holes, pinholes as verified by on-line electrical detection, bubbles, blisters, excessive contamination by foreign matter, and nicks and cuts on roll edges.

C. Geomembrane material is to be supplied in roll form. Each roll is to be identified with labels indicating both number, thickness, length, width and manufacturer.

D. All liner sheets produced at the factory shall be inspected prior to shipment for compliance with the physical property requirements listed in Section 8.2, and be tested by an acceptable method of inspecting for pinholes. If pinholes are located, identified and indicated during manufacturing, these pinholes may be corrected during installation.

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8.4 Smooth, white surfaced geomembrane shall meet the requirements shown in Table 1.2

The geomembrane shall be a white-surfaced, coextruded geomembrane. The white surface shall be installed upwards.

8.5 Extrudate Rod or Bead

A. Extrudate material shall be made from same type resin as the geomembrane.

B. Additives shall be thoroughly dispersed.

C. Materials shall be free of contamination by moisture or foreign matter.

9.0 EQUIPMENT

Welding equipment and accessories shall meet the following requirements:

9.1 Gauges showing temperatures in apparatus (extrusion welder) or wedge (wedge welder) shall be present.

9.2 An adequate number of welding apparatus shall be available to avoid delaying work.

9.3 Power source capable of providing constant voltage under combined line load shall be used.

10.0 DEPLOYMENT

10.1 Assign each panel a simple and logical identifying code. The coding system shall be subject to approval and shall be determined at the job site.

10.2 Visually inspect the geomembrane during deployment for imperfections and mark faulty or suspect areas.

10.3 Deployment of geomembrane panels shall be performed in a manner that will comply with the following guidelines:

A. Unroll geomembrane panels using methods that will not damage geomembrane and will protect underlying surface from damage (i.e., spreader bar, protected equipment bucket).

B. Place ballast (commonly sandbags) on geomembrane that will not damage geomembrane to prevent wind uplift.

C. Personnel walking on geomembrane shall not engage in activities or wear shoes that could damage the geomembrane. Smoking will not be permitted on the geomembrane.

D. Do not allow heavy vehicular traffic directly on geomembrane. Rubber-tired ATV's and trucks are acceptable if wheel contact is less than six psi.

E. Protect geomembrane in areas of heavy traffic by placing protective cover over the geomembrane.

10.4 Sufficient material (slack) shall be provided to allow for thermal expansion and contraction of the material.

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11.0 FIELD SEAMING

11.1 Seams shall meet the following requirements:

A. To the maximum extent possible, orient seams parallel to line of slope, i.e., down and not across slope.

B. Minimize number of field seams in corners, odd shaped geometric locations and outside corners.

C. Slope seams (panels) shall extend a minimum of five-feet beyond the grade break into the flat area.

D. Use a sequential seam numbering system compatible with panel numbering system that is agreeable to the consultant and installer.

E. Align seam overlaps consistent with the requirements of the welding equipment being used. A six-inch overlap is commonly suggested.

11.2 During Welding Operations provide at least one Master Seamer who shall provide direct supervision over other welders as necessary.

11.3 Extrusion Welding

A. Hot-air tack adjacent pieces together using procedures that do not damage geomembrane.

B. Clean geomembrane surfaces by disc grinder or equivalent.

C. Purge welding apparatus of heat degraded extrudate before welding.

11.4 Hot Wedge Welding

A. Welding apparatus shall be a self-propelled device equipped with an electronic controller that displays applicable temperatures.

B. Clean seam area of dust, mud, moisture and debris immediately ahead of the hot wedge welder.

C. Protect against moisture build up between sheets.

12.0 Trial Welds

A. Perform trial welds on geomembrane samples to verify welding equipment is operating properly.

B. Make trial welds under the same surface and environmental conditions as the production welds, i.e., in contact with subgrade and similar ambient temperature.

C. Minimum of two trial welds per day, per welding apparatus, one made prior to the start of work and one completed at mid shift.

D. Cut four, one-inch wide by six-inch long test strips from the trial weld.

E. Quantitatively test specimens for peel adhesion, and then for bonded seam strength (shear).

F. Trial weld specimens shall pass when the results shown in Table 3 are achieved in both peel and shear test.

1. The break, when peel testing, occurs in the liner material itself, not through peel separation (FTB).

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2. The break is ductile.

G. Repeat the trial weld, in its entirety, when any of the trial weld samples fail in either peel or shear.

H. No welding equipment or welder shall be allowed to perform production welds until equipment and welders have successfully completed trial weld.

12.2 Seaming shall not proceed when ambient air temperature or adverse weather conditions jeopardize the integrity of the liner installation. Installer shall demonstrate that acceptable seaming can be performed by completing acceptable trial welds.

12.3 Defects and Repairs

A. Examine all seams and non-seam areas of the geomembrane for defects, holes, blisters, undispersed raw materials, and any sign of contamination by foreign matter.

B. Repair and non-destructively test each suspect location in both seam and non-seam areas. Do not cover geomembrane at locations that have been repaired until test results with passing values are available.

13.0 FIELD QUALITY ASSURANCE

13.1 Manufacturer/installer shall participate in and conform to all terms and requirements of the Owner's quality assurance program. Contractor shall be responsible for assuring this participation.

13.2 Field Testing

A. Non-destructive testing shall be carried out as the seaming progresses.

1. Vacuum Testing - Shall be performed in accordance with ASTM D 5641, Standard Practice for Geomembrane Seam Evaluation by Vacuum Chamber.

2. Air Pressure Testing - Shall be performed in accordance with ASTM D 5820, Standard Practice for Pressurized Air Channel Evaluation of Dual Seamed Geomembranes.

13.3 Destructive Testing (performed by the installer witnessed by the consultant)

A. Location and Frequency of Testing

1. Collect destructive test samples at a frequency of one per every 1500 lineal feet of seam length.

2. Test locations will be determined after seaming.

3. Exercise Method of Attributes as described by GRI GM-14 (Geosynthetics Institute, http://www.geosynthetic-institute.org) to minimize test samples taken.

B. Sampling Procedures are performed as follows:

1. Installer shall cut samples at locations designated by the consultant as the seaming progresses in order to obtain field laboratory test results before the geomembrane is covered.

2. Consultant will number each sample, and the location will be noted on the installation as built.

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3. Samples shall be twelve inches wide by minimal length with the seam centered lengthwise.
4. Cut a two-inch wide strip from each end of the sample for field-testing.
5. Cut the remaining sample into two parts for distribution as follows:
   a. One portion for installer, twelve -inches by twelve inches
   b. One portion for the third party laboratory, 12-inches by 18-inches
   c. Additional samples may be archived if required.

C. Destructive testing shall be performed in accordance with ASTM D 6392, Standard Test Method for Determining the Integrity of Non-Reinforced Geomembrane Seams Produced Using Thermo-Fusion Methods.

D. Installer shall repair all holes in the geomembrane resulting from destructive sampling.

E. Repair and test the continuity of the repair in accordance with these Specifications.

13.4 Failed Seam Procedures

A. If the seam fails, installer shall follow one of two options:
   1. Reconstruct the seam between any two passed test locations.
   2. Trace the weld to an intermediate location at least ten feet minimum or to where the seam ends in both directions from the location of the failed test.

B. The next seam welded using the same welding device is required to obtain an additional sample, i.e., if one side of the seam is less than ten feet long.

C. If sample passes, then the seam shall be reconstructed or capped between the test sample locations.

D. If any sample fails, the process shall be repeated to establish the zone in which the seam shall be reconstructed.

14.0 REPAIR PROCEDURES

14.1 Remove damaged geomembrane and replace with acceptable geomembrane materials if damage cannot be satisfactorily repaired.

14.2 Repair any portion of unsatisfactory geomembrane or seam area failing a destructive or non-destructive test.

14.3 Installer shall be responsible for repair of defective areas.

14.4 Agreement upon the appropriate repair method shall be decided between consultant and installer by using one of the following repair methods:

A. Patching - Used to repair large holes, tears, undispersed raw materials and contamination by foreign matter.

B. Abrading and Rewelding - Used to repair short section of a seam.

C. Spot Welding - Used to repair pinholes or other minor, localized flaws or where geomembrane thickness has been reduced.

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D. Capping - Used to repair long lengths of failed seams.

E. Flap Welding - Used to extrusion weld the flap (excess outer portion) of a fusion weld in lieu of a full cap.

F. Remove the unacceptable seam and replace with new material.

14.5 The following procedures shall be observed when a repair method is used:

A. All geomembrane surfaces shall be clean and dry at the time of repair.

B. Surfaces of the polyethylene that are to be repaired by extrusion welds shall be lightly abraded to assure cleanliness.

C. Extend patches or caps at least six inches for extrusion welds and four inches for wedge welds beyond the edge of the defect, and around all corners of patch material.

14.6 Repair Verification

A. Number and log each patch repair (performed by consultant).

B. Non-destructively test each repair using methods specified in this Specification.

Table 3.1: Minimum Weld Values for Smooth HDPE Geomembranes

Property	**Test Method**	**60 (1.5)**
Peel Strength (fusion), ppi (kN/m)	ASTM D 6392	98 (17)
Peel Strength (extrusion), ppi (kN/m)	ASTM D 6392	78 (14)
Shear Strength (fusion & ext.), ppi (kN/m)	ASTM D 6392	121 (21)

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Table 1.2: Minimum Values for Smooth White-Surfaced HDPE Geomembranes

Property	Test Method	
Thickness, mil (mm)	ASTM D 5199	
Minimum Average		60 (1.5)
Lowest Individual Reading		54 (1.4)
Density, g/cm^3	ASTM D 1505	0.94
Carbon Black Content[(2)], %	ASTM D 1603	2.0
Carbon Black Dispersion	ASTM D 5596	*Note 3*
Tensile Properties:	ASTM D 638	
(each direction)	Type IV, 2 ipm	
Strength at Yield, lb/in (kN/m)		130 (23)
Strength at Break, lb/in (kN/m)		243 (43)
Elongation at Yield, %	(1.3" gauge length)	13
Elongation at Break, %	(2.0" gauge length)	700
Tear Resistance, lb (N)	ASTM D 1004	42 (187)
Puncture Resistance, lb (N)	ASTM D 4833	119 (530)
Notched Constant Tensile Load, hours	ASTM D 5397,	400
Oxidative Induction Time, min.	ASTM D 3895	100

Geomenbrane may have an overall ash content greater than 3.0% due to the white layer.

The OIT values apply to the black layer only.

Only near spherical agglomerates are considered. 9 of 10 views shall be Category 1 or 2. No more than one view Category 3.

END OF SECTION

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1.0 SCOPE OF WORK

1.1 The work to be performed under this section of the specification shall consist of furnishing all necessary supervision, materials, labor, and equipment to design a shotcrete mix, prepare the surface and install the repair/wear layer on the ash pond inlet structures as specified herein.

1.2 Shotcrete Mix: The shotcrete mix selected by the contractor shall be designed to minimize shrinkage cracking and to provide an abrasion resistant surface.

A. Option 1: Use a mix design of Portland cement, hard natural aggregates and admixtures that data and references show to be abrasion resistant.

B. Option 2: Incorporate silica fume into the mix design at a rate of not less than 4%.

2.0 REFERENCES

2.1 American Concrete Institute

A. ACI 308 Standard Practice for Curing Concrete

B. ACU 506R Guide to Shotcreting

C. ACI 506.2 Specification for Shotcrete

2.2 American Society for Testing and Materials

A. ASTM C33 Standard Specification for Concrete Aggregates

B. ASTM C150 Standard Specification for Portland Cement

C. ASTM C309 Standard Specification for Liquid Membrane Forming Compounds for Curing Concrete

D. ASTM C685 Standard Specification for Concrete Made by Volumetric Batching and Continuous Mixing

E. ASTM C1116 Standard Specification for Fiber Reinforced Concrete and Shotcrete

3.0 MATERIALS

3.1 Cement: Portland Cement conforming to ASTM C150 Type I.

3.2 Aggregate: Shall conform to ASTM C33.

3.3 Mixing Water: Shall conform to the requirements of ASTM C-94.

3.4 Silica Fume: "Force 10,000D" microsilica as manufactured by W.R. Grace or an approved equal.

3.5 Synthetic Reinforcing Fibers: "Strux 85/50" fibers as manufactured by W.R. Grace or an approved equal.

3.6 Curing Compounds: Wax based (Type I) or water emulsified, resin base (Type II)

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4.0 SUBMITTALS

4.1 The contractors shall submit the proposed mix designs and test data with their proposal. If test data is not available prior to award, the contractor shall be responsible for performing preconstruction testing of the mix after award. The mix shall have a 28-day strength of not less than 6,000 psi.

4.2 Two weeks before starting the shotcreting work, the contractor shall submit the qualifications of the nozzlemen who will be performing the work. Every nozzelman shall be certified and have a minimum of 3000 hours of experience as a nozzleman.

5.0 SURFACE PREPARATION

5.1 Inspect surfaces and conditions where shotcrete is to be placed. Notify the Owner's Representative immediately of any unsatisfactory conditions and do not proceed until those unsatisfactory conditions have been corrected.

5.2 Remove previously applied patching materials.

5.3 Chip or scarify the edges of the eroded areas of the concrete slab such that the change in thickness of the shotcrete application will be no greater than ¼" per linear foot. Scarify the remainder of the existing structure to allow for a minimum shotcrete application of ¾". Taper edges to leave no square shoulders at the perimeter of a cavity. Perform these procedures with equipment and in a manner that leaves the maximum reveal to insure excellent bonding.

5.4 Inspect the surface upon completing the scarifying to insure no residual fractured fragments from the scarifying process remain.

5.5 Thoroughly clean the surfaces to be repaired by water blasting to remove any traces of dirt, dust, grease, oil or other substances that could effect the bond of the shotcrete to the existing concrete.

5.6 Adequately saturate the repair surface before beginning the shotcreting process.

6.0 INSTALLATION

6.1 Shotcrete shall be applied using the dry mix process.

6.2 Batching and Mixing:

A. Materials shall be volume proportioned by a calibrated screw conveyor or other approved methods.

B. Batching tolerances shall not exceed 1% for water, 1 1/2% for cementitious materials, 2% for sand and coarse aggregates and 3% for reinforcing fibers.

C. The percentage of surface moisture in the sand shall be maintained within 3% to 6% by weight.

D. Shotcrete batches that have been in contact with damp aggregate or other moisture for more than two hours shall be wasted at the contractor's expense.

E. Mixers for the mixing the dry ingredients shall be capable of mixing and discharging a uniform product without segregation of ingredients.

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F. The discharge nozzle of the applicator shall be equipped with a manual water injection system capable of ready adjustment and convenient to the nozzleman.

6.3 Placing of Shotcrete:

A. Shotcrete shall be placed, starting at the bottom of the Work and proceeding upward, using nozzles and air compressors capable of supplying clean and dry air adequate for maintaining uniform and sufficient nozzle velocity for the Work.

B. The minimum thickness of shotcrete shall be ¾" per layer. The maximum total thickness shall not exceed 3" per layer, unless otherwise indicated on the Contract Drawings.

C. The surface of freshly placed shotcrete shall be broomed or cleaned to remove laitance. Shotcrete shall be placed in one layer; where shotcrete is placed over existing cementitious surfaces, such surfaces shall be dampened prior to application of the new shotcrete.

D. The finished repair surface shall not very from smooth by more than +/- ¼" within any ten feet.

E. Fill corners filled first with sound material so as to prevent rebound collecting therein. Corners, or any area where rebound cannot easily escape or be blown out, are the most likely places for "sand pockets" to develop.

F. If placement results in sagging or sloughing off of materials, shotcreting shall be halted until causes have been determined and corrections have been made. If wind or air currents cause separation of nozzle stream during placement, or if rain occurs and it may wash cement out of the freshly placed material, shotcreting shall be discontinued or suitable means shall be provided to eliminate the problem. Shotcreting shall not be performed when ambient temperature is below 40°F at the pump or at the placement area.

G. The contractor shall provide and maintain sufficient standby equipment to assure continuous production and application of shotcrete.

6.4 All construction, placement and other joints shall be tapered with a height of at least twice the shotcrete thickness.

6.5 Any placed shotcrete which is damaged, or lacks uniformity, exhibits segregation, honeycomb or lamination, or contains dry patches, slugs, voids or sand pockets, shall be removed and replaced with dry mixed mortar.

6.6 Under no circumstances shall any rebound or previously expended material be used in the shotcrete mix.

6.7 Curing:

A. Curing shall commence immediately after the concrete has attained enough set to prevent damage to the concrete surface. Water curing shall be continued for seven days after shotcreting. During this curing period, the shotcrete work shall be maintained above 50°F.

B. After water curing, final curing may be performed by apply curing compounds. The rate of application shall be at least twice that recommended by the manufacturer for smooth concrete surfaces.

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7.0 INSPECTION AND TESTING

7.1 Contractor shall be responsible for all inspection and testing work as required or as needed, unless otherwise indicated. Owner's Representative may, during the course of the Work, observe the various phases of the Work for full compliance with all requirements of this Specification and the Contract Drawings. Any work failing to meet the specified requirements shall be rectified or replaced by Contractor at his expense at no additional cost to Owner.

7.2 Test Specimens:

A. Test specimens shall be made by each shotcrete application crew using the materials, equipment, and mix proportions used for the subject work.

B. A test panel of at least 30" x 30" shall be made with suitable backing material for each mix design being considered, and also for each shooting position to be encountered in the Work (i.e., horizontal, vertical and overhead positions). At least half of each panel to be tested for proper embedment of reinforcement shall contain the same reinforcement as the structure. The thickness of test panels shall be the same as the structure.

C. At least five cores shall be taken from each test panel for testing. All cored surfaces shall be dense and free from laminations and sand pockets. Embedment of reinforcement shall be examined in each panel.

7.3 Test specimens shall be obtained and tested in accordance with ASTM C42 and C39 for compressive strength only.

END OF SECTION

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APPENDIX B-3

East Ash Basin Slope Modification Technical Specifications

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SECTION 02200

EARTHWORK

PART 1 – GENERAL

1.01 DESCRIPTION OF WORK

A. The Contractor shall furnish all labor, materials, tools, supervision, transportation, equipment, and incidentals necessary to perform all Earthwork. The Work shall be carried out as specified herein and in accordance with the Construction Drawings.

B. The Work shall include, but not be limited to clearing and grubbing, excavating, hauling, placing, moisture conditioning, backfilling, compacting, grading, and subgrade preparation. Earthwork shall conform to the dimensions, lines, grades and sections shown on the Construction Drawings or as directed by the Construction Manager.

1.02 RELATED SECTIONS

A. Section 02770 – Geosynthetics

1.03 REFERENCES

A. Construction Drawings

B. Latest version of the Occupational Safety and Health Administration (OSHA) rules and regulations.

C. "Stormwater Pollution Prevention Plan, East Ash Basin Slope Modification", Geosyntec, July 2016.

D. 2015 Standard Specifications for Public Works Construction "Greenbook" (Greenbook)

E. "Construction Quality Assurance (CQA) Plan, East Ash Basin Slope Modification, Waukegan Generating Station" by Geosyntec, dated June 2016

F. Illinois Department of Transportation (IDOT), Standard Specifications for Road and Bridge Construction, January 2012.

G. Latest version of the American Society for Testing and Materials (ASTM) standards:

ASTM C136	Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates
ASTM D422	Standard Method for Particle-Size Analysis of Soils
ASTM D1557	Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft^3 (2,700 kN-m/m^3))
ASTM D2487	Standard Test Method for Classification of Soils for Engineering Purposes
ASTM D6938	Standard Test Method for In-Place Density and Water Content of Soil and Soil Aggregate by Nuclear Methods (Shallow Depth)

H. Submittals

I. The Contractor shall submit to the Construction Manager a description of equipment and methods proposed for all earthwork components including excavation, ash relocation, select and engineered fill placement, moisture conditioning, and compaction, stockpiling, road subgrade preparation and road surfacing placement and compaction at least 5 days prior to the start of activities covered by this Section.

J. The Contractor shall submit copies of all permits obtained for site work. The permits shall be provided prior to initiating the applicable site activities.

K. The Contractor shall submit as-built Record Drawing electronic files and data, to the Construction Manager, within 7 days of project substantial completion, in accordance with this Section. The Record Drawings shall be submitted in AutoCAD version 2015 format or newer, or in a DXF format that can be converted to AutoCAD.

1.04 QUALITY ASSURANCE

A. The Contractor shall ensure that the materials and methods used for Earthwork meet the requirements of the Construction Drawings and this Section. Any material or method that does not conform to these documents, or to alternatives approved in writing by the Construction Manager will be rejected and shall be repaired or replaced by the Contractor at the Contractor's expense.

B. The Contractor shall be aware of and accommodate all monitoring and field/laboratory conformance testing required by the CQA Plan. This monitoring and testing, including random conformance testing of construction materials and completed Work, will be performed by the CQA Consultant. If nonconformances or other deficiencies are found in the materials or completed Work, the Contractor will be required to repair the deficiency or replace the deficient materials at no additional cost to the Owner.

PART 2 – PRODUCTS

2.01 MATERIALS

A. Engineered Fill – Engineered Fill shall consist of relatively homogeneous soils that contain no debris, foreign objects, large rock fragments (greater than 6 inches in maximum dimension), roots, and organics. No materials larger than 6 inches shall be allowed within the Engineered Fill. The Engineered Fill shall be classified according to the Unified Soil Classification System (per ASTM D2487) as, ML, CL, CL-ML, SM, SC, SW, SP, GW, GP, GM, GC, or combinations of these materials. The Contractor may propose the use of other soil types as Engineered Fill, but such use shall be at the sole discretion of the Engineer.

B. Select Soil – Select Soil shall have at least 40 percent material smaller than ¼-inch in size, no particles larger than 3 inches, and not having any sharp, angular pieces greater than ¼-inch or perishable, spongy, deleterious, or otherwise unsuitable material. Select soil shall be utilized to backfill geomembrane anchor trenches.

C. Aggregate Base – Aggregate Base shall meet the requirements of Illinois Department of Transportation Gradation CA 6.

D. CCR – CCR (Coal Combustion Residuals) are materials located within the geomembrane lined areas of the West and East Ash Basins.

2.02 EQUIPMENT

A. The Contractor shall furnish, operate, and maintain compaction equipment as necessary to produce the required in-place soil density and moisture content.

B. The Contractor shall furnish, operate and maintain tank trucks, pressure distributors, or other equipment designed to apply water uniformly and in controlled quantities to variable surface widths.

C. The Contractor shall furnish, operate, and maintain miscellaneous equipment such as scarifiers or disks, earth excavating equipment, earth hauling equipment, and other equipment, as necessary for Earthwork construction.

D. When relocating CCR Deposits or placing excavated material within the basin in areas lined with a geomembrane, the Contractor shall use equipment which will not damage the underlying geomembrane in accordance with the Geomembrane Manufacturer's recommendations.

PART 3 – EXECUTION

3.01 GENERAL

A. The Contractor shall not disturb or impact areas outside of the limits of work as defined on the Construction Drawings without prior approval from the Construction Manager. If work outside of the limit cannot be avoided, the Contractor shall notify the Construction Manager a minimum of 3 days prior to disturbance outside of the limits for approval prior to starting the work.

B. Prior to initiating earthwork activities, the Contractor shall have implemented the site SWPPP.

C. The Contractor shall obtain all applicable grading permits, or other applicable work permits, prior to initiating the work covered by the permit.

D. When hauling is done over roadways or city streets, the loads shall comply with legal load requirements, all material shall be removed from shelf areas of vehicles in order to eliminate spilling of material, and loads shall be watered or covered to eliminate dust.

E. Under this Work, the Contractor shall apply water for dust control, for compaction purposes, and for such other purposes (not provided for in other Sections) called for on the Construction Drawings or as directed by the Construction Manager. Contractor shall coordinate with Owner for access to onsite water source. Contractor shall not waste water or allow water application to create erosion or other deleterious conditions to the work area or adjacent areas.

F. Well heads for existing groundwater wells within the work area will removed by others and wells will be capped prior to work. The Contractor shall provide protection to existing groundwater monitoring wells throughout construction. Any damage to these items shall be repaired or replaced to the Construction Manager's satisfaction at the Contractor's sole expense.

3.02 FAMILIARIZATION

A. Prior to implementing any of the Work in this Section, the Contractor shall become thoroughly familiar with the Site, the Site conditions, and all portions of the Work falling within this and other related Sections.

3.03 CLEARING AND GRUBBING

A. Prior to Site clearing, Contractor shall have implemented the SWPPP.

B. The Contractor shall remove and properly dispose of all vegetation, debris, organic and deleterious material that exist along the crest of the embankment and eastern and southern facing slopes of the embankment within the work area.

C. No burning of combustible materials shall be allowed.

D. Clearing and grubbing shall include, but not be limited to removal and disposal of trees, plants and shrubs and vegetation as well as rocks, and surficial and shallow debris.

E. Vegetation, debris and organic matter shall be properly disposed of offsite.

F. Remove all tree root balls associated with trees with a diameter greater than 4-inches. Tree root ball holes in non-excavation areas shall be backfilled in accordance with Section 3.07.

3.04 EXCAVATION

A. CCR located on top of the geomembrane along the slope area within the East Ash Basin shall be relocated, as necessary, to accommodate grading of the embankment. Excavated CCR materials shall be placed within the western portion of the East Ash Basin. CCR shall not be placed at inclinations greater than 5H:1V (Horizontal:Vertical). Excavation of CCR shall be performed with care to ensure no damage to the underlying geomembrane. Damage to the underlying geomembrane shall be repaired to the Construction Manager's satisfaction at the Contractor's expense.

B. Perform all excavations, regardless of the type, nature, or condition of material encountered, as specified, shown, required or implied to accomplish the construction. Excavated soil shall be placed within the western portion of the East Ash Basin at inclinations no greater than 5H:1V.

C. Allow for working space, overlying materials, and finish grades as shown or required. Do not carry excavations deeper than the elevation shown, unless soft or wet materials are encountered. Excavation carried below the grade lines in areas of unsuitable materials, including root balls, shall be replaced with over excavated material compacted to at least 90% relative compaction and to -3 percent to +1 percent of optimum moisture. Cuts below grade shall be corrected by filling and compacting soil material to at least 90% relative compaction and -3 percent to +1 percent of optimum moisture, and creating a smooth transition. All overexcavation in areas of suitable materials will be filled and compacted at the Contractor's expense.

D. After completion of excavation, and prior to placement of aggregate base on the embankment crest (Section 3.06), proof-roll the berm crest to detect soft, wet, or loose materials. Notify the Owner or Owner's Representative prior to commencement of proof rolling. If soft, wet, or loose materials are found, excavate the soft or loose material to a depth accepted by the Engineer, then fill and compact in accordance with Section 3.07.

E. Perform all earthwork to the lines and grades as shown and/or established by the Owner or Owner's Representative. Make slopes free of all exposed roots and stones exceeding 3-inch diameter which are loose and liable to fall. Neatly blend all new grading into surrounding, existing terrain. The Owner or Owner's Representative shall review finished site grading.

F. After excavating existing aggregate base materials on the embankment crest within the work area, Contractor shall remove existing geotextile and properly dispose of offsite.

3.05 ANCHOR TRENCH EXCAVATION AND BACKFILL

A. The Contractor shall excavate 2 ft by 2 ft anchor trenches to secure the geomembrane prior to placement of the geotextile and aggregate base material.

B. Anchor trenches shall be backfilled with select fill and compacted in accordance with Subpart 3.07, below.

3.06 ACCESS ROAD SURFACING

A. The Contractor shall grade access road along the crest of the embankment to the widths and minimum slope inclinations as shown on the Construction Drawings.

B. Prior to placing aggregate base, the Contractor shall moisten the area to be covered. The area shall be kept moist, but not wet (i.e. no ponding water or saturated soils), until the geotextile and overlying aggregate base is installed.

C. Geotextile shall be placed prior to aggregate base placement in accordance with Section 02770.

D. The access road shall be surfaced with 4 inches of aggregate base to the lines and grades shown on the Construction Drawings. Aggregate base shall be as described in Section 2.01 and in locations indicated on the Construction Drawings.

E. The aggregate base shall be compacted to a minimum of 95 percent relative compaction and within ± 2 percent of the optimum moisture content as determined by ASTM D1557.

F. After initial compaction, the Contractor shall trim off high spots to within tolerance wherever the finished surface is higher than the specified tolerance. Following trimming, the Contractor shall compact trimmed areas with one complete coverage so the entire layer complies with compaction requirements. Loose material at the surface and tear marks shall not be permitted.

3.07 ENGINEERED AND SELECT FILL

A. Prior to placing engineered fill, the soil subgrade shall be scarified to a depth of 6 inches and recompacted.

B. Engineered fill and select fill shall be compacted to a minimum of 90 percent relative compaction and -3 percent to +1 percent of optimum moisture percent as measured in accordance with ASTM D1557.

3.08 STOCKPILING

A. If deemed acceptable for reuse, existing aggregate base material may be stockpiled within the laydown area or an area approved by the Owner. Stockpiles shall be no steeper than 2.5H:1V (Horizontal:Vertical), unless stockpiles are to be created within the East Ash Basin in which case the stockpiles shall be no steeper than 5H:1V, or other slope approved by the Engineer, graded to drain, sealed by tracking parallel to the slope with a dozer or other means approved by the Construction Manager, and dressed daily during periods when fill is taken from the stockpile. The Contractor shall employ temporary erosion and sediment control measures (i.e. silt fence) around stockpile areas in accordance with Construction Drawings.

B. There are no compaction requirements for temporary stockpiled materials.

3.09 FIELD TESTING

A. The minimum frequency and details of quality control testing are provided below. This testing will be performed by the CQA Consultant. Additional testing may be performed at the discretion of the CQA Consultant, Construction Manager or Owner. The Contractor shall consider this testing frequency when preparing the construction schedule.

1. The CQA Consultant will perform conformance tests on placed and compacted engineered fill, select soil and aggregate base to evaluate compliance with these Specifications. These tests will include in-situ moisture content and dry density. The frequency and procedures for moisture-density testing are provided in the CQA Plan. At a minimum, the dry density and moisture content of the soil will be measured in-situ in accordance with ASTM D6938. The CQA Consultant shall approve the material prior to placement of overlying materials.

2. Increased testing frequencies may be used by the CQA Consultant when visual observations of construction performance indicate a potential problem. Additional testing will be considered when:

    a. The rollers slip during rolling operation

    b. The lift thickness is greater than specified

    c. The fill is at improper and/or variable moisture content

    d. Fewer than the specified number of roller passes are made

    e. Dirt-clogged rollers are used to compact the material

    f. The rollers do not have optimum ballast

    g. The degree of compaction is doubtful

3. During construction, the frequency of testing will be increased by the CQA Consultant in the following situations:

    a. Adverse weather conditions

    b. Breakdown of equipment

    c. At the start and finish of grading

    d. If the material fails to meet specifications

    e. The Work area is reduced

B. Defective Areas:

1. If a defective area is discovered in the Earthwork, the CQA Consultant will evaluate the extent and nature of the defect. If the defect is indicated by an unsatisfactory test result, the CQA Consultant will determine the extent of the defective area by additional tests, observations, a review of records, or other means that the CQA Consultant deems appropriate. If the defect is related to adverse Site conditions, such as overly wet soils or surface desiccation, the CQA Consultant shall define the limits and nature of the

defect. The CQA Consultant shall notify the Construction Manager within 1 day of defective area discovery.

2. Once the extent and nature of a defect is determined, the Contractor shall correct the deficiency to the satisfaction of the CQA Consultant and Construction Manager. The Contractor shall not perform additional Work in the area until the CQA Consultant and Construction Manager approve the correction of the defect.

3. Additional testing may be performed by the CQA Consultant to verify that the defect has been corrected. This additional testing will be performed before any additional Work is allowed in the area of deficiency. The cost of the additional testing shall be borne by the Contractor.

3.10 SURVEY CONTROL

A. The Contractor shall perform all surveys necessary for construction layout and control.

1. At a minimum, all surfaces should be surveyed on a square grid not wider spaced than 50 ft and shall include additional points for grade breaks (top and toe of slope).

3.11 CONSTRUCTION TOLERANCE

A. Tolerances for designed thicknesses shown on Construction Drawings and for elevations shown on Construction Drawings are ±0.10 foot unless otherwise specified.

3.12 AS-BUILT SURVEY

A. The Contractor shall produce complete electronic as-built Record Drawings in conformance with the requirements set forth in this Section. This electronic file shall be provided to the Construction Manager for verification. Surveys shall be submitted for the following:

1. Existing topography;

2. Anchor trench;

3. Finish grade and limits of the access road;

4. Final topography.

A. Record survey shall be performed, at a minimum, at all grade breaks, flow lines, and on a 50-foot grid.

3.13 PROTECTION OF WORK

A. The Contractor shall use all means necessary to protect completed Work of this Section.

B. At the end of each day, the Contractor shall verify that the entire Work area is left in a state that promotes drainage of surface water away from the area and from finished Work. If threatening weather conditions are forecast, at a minimum, compacted surfaces shall be seal-rolled to protect finished Work.

C. In the event of damage to prior Work, the Contractor shall make repairs and replacements to the satisfaction of the Construction Manager, at the expense of the Contractor.

[END OF SECTION]

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SECTION 02770
GEOSYNTHETICS

PART 1 – GENERAL

1.01 DESCRIPTION OF WORK

A. The Contractor shall furnish all labor, materials, tools, supervision, transportation, equipment, and incidentals necessary for the repair of the existing geomembrane and installation of geotextile. The Work shall be carried out as specified herein and in accordance with the Drawings.

B. The Work shall include, but not be limited to, delivery, storage, and placement of the various geosynthetic components of the project.

C. The intent is for the Contractor to re-use existing geomembrane by cutting the existing geomembrane in sections to facilitate folding the geomembrane down the slope to allow excavation of the underlying soils. Contractor shall exercise caution while folding geomembrane and excavating soil to not damage the existing geomembrane. Once excavation is complete and the new anchor trench has been excavated, the intent is to pull the sections of geomembrane back up the slope, cut the geomembrane to the appropriate length, and place the geomembrane into the new anchor trench. Vertical cuts in the existing geomembrane, along with other damage, will be repaired with new geomembrane, in accordance with this section.

D. Geotextile shall be placed beneath the aggregate base surfacing on the embankment crest.

E. Existing geomembrane shall be repaired/patched as necessary to achieve the lines and grades shown on the Drawings.

1.02 RELATED SECTIONS

Section 02200 – Earthwork

1.03 REFERENCES

A. Drawings

B. "Construction Quality Assurance (CQA) Plan, East Ash Basin Slope Modification, Waukegan Generating Station" by Geosyntec, dated June 2016

C. Latest version of ASTM International (ASTM) standards:

ASTM D792	Standard Test Methods for Specific Gravity (Relative Density) and Density of Plastics by Displacement
ASTM D1004	Standard Test Method for Initial Tear Resistance (Graves Tear) of Plastic Film and Sheeting
ASTM D1238	Standard Test Method for Melt Flow Rates of Thermoplastics by Extrusion Plastometer
ASTM D1505	Standard Test Methods for Density of Plastics by Density-Gradient Technique

ASTM D1603 Standard Test Method for Carbon Black in Olefin Plastics

ASTM D4355 Standard Test Method for Deterioration of Geotextiles by Exposure to Light, Moisture and Heat in a Xenon Arc Type Apparatus

ASTM D4439 Terminology for Geosynthetics

ASTM D4632 Standard Test Method for Grab Breaking Load and Elongation of Geotextiles

ASTM D4833 Standard Test Method for Index Puncture Resistance of Geotextiles, Geomembranes, and Related Products

ASTM D4873 Standard Guide for Identification, Storage, and Handling of Geosynthetic Rolls and Samples

ASTM D5199 Standard Test Method for Measuring the Nominal Thickness of Geosynthetics

ASTM D5397 Standard Test Method for Evaluation of Stress Crack Resistance of Polyolefin Geomembranes Using Notched Constant Tensile Load Test

ASTM D5641 Practice for Geomembrane Seam Evaluation by Vacuum Chamber

ASTM D5820 Practice for Pressurized Air Channel Evaluation of Dual Seamed Geomembranes

ASTM D6241 Standard Test Method for the Static Puncture Strength of Geotextiles and Geotextile-Related Products using a 50-mm Probe

ASTM D6392 Standard Test Method for Determining the Integrity of Nonreinforced Geomembrane Seams Produced using Thermo-Fusion Methods.

ASTM D6693 Standard Test Method for Determining Tensile Properties of Nonreinforced Polyethylene and Nonreinforced Flexible Polypropylene Geomembranes

D. GRI GM9 Cold Weather Seaming of Geomembranes

E. GRI GM10 The Stress Crack Resistance of HDPE Geomembrane Sheet

F. GRI GM13 Test Methods, Test Properties and Testing Frequency for High Density Polyethylene (HDPE) Smooth and Textured Geomembranes

G. GRI GM19 Seam Strength and Related Properties of Thermally Bonded Polyolefin Geomembranes

1.04 WARRANTY

A. The Geosynthetic Installer shall furnish the Owner with a 1-year written warranty against defects in workmanship. Warranty conditions concerning limits of liability will be evaluated by, and must be acceptable to, the Owner.

1.05 SUBMITTALS

A. The Contractor shall submit to the Construction Manager, at least 7 days prior to commencement of work, the following information regarding the proposed geomembrane and geotextile:

1. Manufacturer and product name

2. Minimum property values of the proposed geotextile and the corresponding test procedures

3. Minimum property values of the proposed geomembrane and the corresponding test procedures

4. Projected delivery dates

5. List of roll numbers for rolls to be delivered to the Site

B. Upon completion of the installation, the Contractor shall be responsible for the submission to the Construction Manager of a warranty as specified in Subpart 1.04 of this Section.

C. Upon completion of the installation of the geomembrane repair, the Contractor shall be responsible for the submission to the Construction Manager of a Record Drawing showing the locations and numbers of repairs.

1.06 QUALITY ASSURANCE

A. The Contractor shall ensure that the geomembrane and geotextile materials, and installation methods used meet the requirements of the Drawings and this Section. Any material or method that does not conform to these documents, or to alternatives approved in writing by the Construction Manager, will be rejected and shall be repaired or replaced by the Contractor.

B. The Contractor shall be aware of and accommodate all monitoring and conformance testing required by the CQA Plan. This monitoring and testing, including random conformance testing of construction materials and completed Work, will be performed by the CQA Consultant. If non-conformances or other deficiencies are found in the Contractor's materials or completed Work, the Contractor will be required to repair the deficiency or replace the deficient materials, at the expense of the Contractor.

PART 2 – PRODUCTS

2.01 GEOTEXTILE

A. Geotextile shall be GEOTEX® 200ST woven polypropylene manufactured by Propex GeoSolutions or equivalent as approved by the Engineer.

B. Geotextile suppliers shall furnish materials, which meet or exceed the criteria specified in Table 02770-1 in accordance with the minimum average roll value (MARV), as defined by ASTM D4439.

2.02 GEOMEMBRANE

A. The geomembrane shall be a 60-mil smooth or textured high density polyethylene (HDPE) geomembrane.

B. Geomembranes shall be produced in rolls free of holes, blisters, striations, undispersed raw materials, or any sign of contamination by foreign matter.

C. Resin used in the manufacturing of the geomembrane shall be new, first-quality, virgin polyethylene resin. The addition of reworked polymer (from the manufacturing process) to resin shall be permitted if it does not exceed 2% by weight, contains no encapsulated scrim, and is performed with appropriate cleanliness. The addition of post-consumer resin shall not be permitted.

D. Geomembrane resin shall be mixed with the specified amount of carbon black. The carbon black shall be pre-blended with the resin.

E. The geomembrane shall exhibit the minimum physical properties listed in Table 02770-2 (smooth geomembrane) or Table 02770-3 (textured geomembrane). Manufacturer quality control testing shall be performed in accordance with the frequencies presented in Table 02770-2 or 02770-3, accordingly.

F. The geomembrane shall be a white-surface geomembrane. The white surface shall be installed upwards.

G. Geomembrane trials seams shall meet the minimum requirements listed in GRI Test Method GM-19, shown in Table 02770-4. Frequency of trial seam testing shall be in accordance with Section 3.05H

H. Resin used for extrusion welding shall be produced from same resin type as the geomembrane and shall be the same color as the geomembrane surface to be exposed (i.e. white). Physical properties of the welding resin shall be the same as those of the resin used in the geomembrane.

2.03 MANUFACTURING QUALITY CONTROL (MQC)

A. The geotextile and geomembrane shall be manufactured with MQC procedures that meet or exceed generally accepted industry standards.

2.04 PACKING AND LABELING

A. Geotextile shall be supplied in rolls wrapped in relatively impermeable and opaque protective covers.

B. Geomembrane and geotextile rolls shall be marked or tagged with the following information:

1. Manufacturer's name
2. Product identification
3. Lot or batch number
4. Roll number

5. Roll dimensions

2.05 TRANSPORTATION, HANDLING, AND STORAGE

A. The Contractor shall be liable for any damage to the materials incurred prior to and during transportation to the Site.

B. Handling, unloading, storage, and care of the geomembrane and geotextile prior to and following installation at the Site, is the responsibility of the Contractor and shall be performed in accordance with ASTM D4873.

C. The geotextile shall be protected from sunlight, puncture, or other damaging or deleterious conditions.

D. The geomembrane shall be protected from excessive puncture, cutting, or other damaging or deleterious conditions. Any additional storage procedures required by the Geomembrane Manufacturer shall be the Contractor's responsibility.

2.06 EQUIPMENT

A. The Contractor shall furnish all necessary equipment required to accomplish the installation of the geosynthetics specified herein.

PART 3 – EXECUTION

3.01 FAMILIARIZATION

A. Prior to implementing any of the work described in this Section, the Contractor shall become thoroughly familiar with the site, the site conditions, and all portions of the Work described in this Section.

B. If the Contractor has any concerns regarding the installed work of other Sections or the site, the Construction Manager shall be notified, in writing, prior to commencing the work. Failure to notify the Construction Manager or commencing installation of the geomembrane or geotextile will be construed as the Contractor's acceptance of the related work of all other Sections.

3.02 GEOTEXTILE PLACEMENT

A. The Contractor shall handle all geotextile in such a manner as to ensure it is not damaged in any way.

B. All geotextiles shall be deployed in accordance with the Manufacturer's recommendations, standards, and guidelines.

C. The Contractor shall ballast or anchor all geotextile with sandbags, or equivalent, to prevent wind uplift.

D. The Contractor shall examine the entire geotextile surface after installation to ensure that no foreign objects are present that may damage the geotextile. The Contractor shall remove any such foreign objects and shall replace any damaged geotextile.

E. Adjacent geotextile panels shall be overlapped a minimum of 12 inches.

3.03 GEOTEXTILE REPAIR

A. Holes or tears in the geotextile shall be repaired as follows: A patch made from the same geotextile shall be overlapped a minimum of 12 inches in each direction.

3.04 GEOMEMBRANE PLACEMENT

A. Cuts to existing geomembrane will be minimized to only those needed to facilitate temporary movement. Horizontal cuts on the side slope will not be allowed. Panel seams shall be installed at an angle of at least 45 degrees from vertical.

B. The geomembrane shall be weighted with sandbags or the equivalent ballast materials, to prevent movement caused by wind. In case of high winds, continuous loading is recommended along edges of panels to minimize risk of wind uplift of panels.

C. Geomembrane shall not be placed when the ambient temperature is below 32°F or above 122°F unless otherwise authorized in writing by the Engineer. Geomembrane panels shall be allowed to equilibrate to temperature of adjacent panels prior to seaming.

D. Geomembrane shall not be placed during any precipitation, in the presence of excessive moisture (e.g., fog, dew), in an area of ponded water, or in the presence of wind speeds greater than 20 mph.

E. The Contractor shall ensure that:

1. No vehicular traffic is allowed on the geomembrane with the exception of ATV's with a contact pressures less than 6 psi.

2. Equipment used does not damage the geomembrane by handling, trafficking, or leakage of hydrocarbons (i.e., fuels).

3. Personnel working on the geomembrane do not smoke, wear damaging shoes, bring glass onto the geomembrane, or engage in other activities that could damage the geomembrane.

4. The method used to unroll the panels does not scratch or crimp the geomembrane and does not damage the supporting soil or geosynthetics.

5. The geomembrane shall be securely anchored and then rolled in such a manner as to continually keep the geomembrane in tension to preclude folding.

6. The method used to place the panels minimizes wrinkles (especially differential wrinkles between adjacent panels). The method used to place the panels results in intimate contact between the geomembrane and adjacent components.

7. The geomembrane is especially protected from damage in heavily trafficked areas.

8. Any field panel or portion thereof that becomes seriously damaged (torn, twisted, or crimped) shall be replaced with new material. Less serious damage to the geomembrane may be repaired, as approved by the Construction Manager and CQA Site Manager. Damaged panels or portions of damaged panels that have been rejected shall be removed from the work area and not reused.

F. If the Contractor intends to install geomembrane between one hour before sunset and one hour after sunrise, he shall notify the Construction Manager in writing prior to the start of

the work. The Contractor shall indicate additional precautions that shall be taken during these installation hours. The Contractor shall provide proper illumination for work during this time period.

3.05 FIELD SEAMING

A. Seam Layout:

1. In corners and at odd-shaped geometric locations, the number of field seams shall be minimized. No seams shall be located in an area of potential stress concentration.

B. Weather Conditions for Seaming:

1. No seaming shall be attempted below 32°F or above 122°F without approval of the Owner or Owner's Representative.

2. Geomembrane seaming below 32°F, if approved by the Owner or Owner's Representative, shall be performed in accordance with GRI Test Method GM9.

3. Preheating of the geomembrane is not required for temperatures above 32°F.

4. Geomembrane shall be dry and protected from wind.

5. In the event of seaming below 32°F or above 122°F, certify in writing that low-temperature or high-temperature seaming procedures does not cause any physical or chemical modification to geomembrane that will generate any short or long-term damage to geomembrane.

C. Seam Preparation:

1. Prior to seaming, seam shall be clean and free of moisture, dust, dirt, debris of any kind, and foreign material.

2. If seam overlap grinding is required, process shall be completed according to the Manufacturer's instructions and in a way not damaging to the geomembrane.

3. Align seams with least possible number of wrinkles and "fish mouths".

D. General Seaming Requirements:

1. Fishmouths or wrinkles at the seam overlaps shall be cut along the ridge of the wrinkle to achieve a flat overlap, ending the cut with circular cut-out. The cut fishmouths or wrinkles shall be seamed and any portion where the overlap is insufficient shall be patched with an oval or round patch of geomembrane that extends a minimum of 6 inches beyond the cut in all directions.

2. Place electric generator on smooth base. Place smooth insulating plate or fabric beneath hot welding apparatus after use. When protective material is in place, sudden stops or starts, sharp turns, and stationary churning of vehicles shall be strictly prohibited. Only use apparatus specifically approved by geomembrane Manufacturer.

3. Use double-track fusion welding for installation seaming wherever possible.

4. Seams shall extend to the top of the anchor trench.

E. Seaming Process:

1. Approved processes for field seaming are fusion welding and extrusion welding. Proposed alternate processes shall be documented and submitted to the Design Engineer and/CQA Engineer for approval prior to use. Extrusion welding shall be restricted to repairs and welding applications not possible by the fusion process.

2. Extrusion Equipment and Procedures:

   a. The Contractor shall maintain at least one spare operable seaming apparatus on site.

   b. Extrusion welding apparatuses shall be equipped with gauges giving the temperatures in the apparatuses.

   c. Prior to beginning an extrusion seam, the extruder shall be purged until all heat-degraded extrudate has been removed from the barrel.

   d. Grind edges of cross seams to an incline prior to welding.

F. Trial Seams:

1. Trial seams shall be made on fragment pieces of geomembrane to verify that seaming conditions are adequate. Trial seams shall be conducted on the same material to be installed and under similar field conditions as production seams. Such trial seams shall be made at the beginning of each seaming period, typically at the beginning of the day and after lunch, for each seaming apparatus used each day, but no less frequently than once every 5 hours. The trial seam sample shall be a minimum of 5 feet long by 1 foot wide (after seaming) with the seam centered lengthwise for fusion equipment and at least 3 feet long by 1 foot wide for extrusion equipment. Seam overlap shall be as indicated in Subpart 3.05.C of this Section.

2. Four coupon specimens, each 1-inch wide, shall be cut from the trial seam sample by the Geosynthetics Installer using a die cutter to ensure precise 1-inch wide coupons. The coupons shall be tested, by the Contractor, with the CQA Site Manager present, in peel (both the outside and inside track for fusion welded seams) and in shear using an electronic readout field tensiometer in accordance with ASTM D 6392, at a strain rate of 2 inches/minute. The samples shall not exhibit failure in the seam, i.e., they shall exhibit a Film Tear Bond (FTB), which is a failure (yield) in the parent material. The required peel and shear seam strength values are listed in Table 02770-4. At no time shall specimens be soaked in water.

3. An additional trial weld shall be performed if a wide change in temperature (± 30ºF), humidity, or wind speed occurs since the previous trial weld.

4. If any coupon specimen fails, the trial seam shall be considered failing and the entire operation shall be repeated. If any of the additional coupon specimens fail, the seaming apparatus and seamer shall not be accepted and shall not be used for seaming until the deficiencies are corrected and two consecutive successful trial seams are achieved.

G. Nondestructive Seam Continuity Testing:

1. The Contractor shall nondestructively test for continuity on all field seams over their full length. Continuity testing shall be carried out as the seaming work progresses, not

at the completion of all field seaming. The Contractor shall complete any required repairs in accordance with Subpart 3.05.I of this Section. The following procedures shall apply:

a. Vacuum testing in accordance with ASTM D 5641.

b. Air channel pressure testing for double-track fusion seams in accordance with ASTM D 5820 and the following:

i. Insert needle, or other approved pressure feed device, from pressure gauge and inflation device into the air channel at one end of a double track seam.

ii. Energize the air pump and inflate air channel to a pressure between 25 and 30 pounds per square inch (psi). Close valve and sustain the pressure for not less than 5 minutes.

iii. If loss of pressure exceeds 3 psi over 5 minutes, or if the pressure does not stabilize, locate the faulty area(s) and repair seam in accordance with Subpart 3.05.I of this Section.

iv. After 5 minutes, cut the end of air channel opposite from the end with the pressure gauge and observe release of pressure to ensure air channel is not blocked. If the channel does not depressurize, find and repair the portion of the seam containing the blockage per Subpart 3.05.I of this Section. Repeat the air pressure test on the resulting segments of the original seam created by the repair and the ends of the seam. Repeat the process until the entire length of seam has successfully passed pressure testing or contains a repair. Repairs shall also be non-destructively tested per Subpart 3.05.I.5 of this Section.

v. Remove needle, or other approved pressure feed device, and seal repair in accordance with Subpart 3.05.I of this Section.

H. Defects and Repairs:

1. The geomembrane will be inspected before and after seaming for evidence of defects, holes, blisters, undispersed raw materials, and any sign of contamination by foreign matter. The surface of the geomembrane shall be clean at the time of inspection. The geomembrane surface shall be swept or washed by the Contractor if surface contamination inhibits inspection.

2. At observed suspected flawed location, both in seamed and non-seamed areas, shall be nondestructively tested using the methods described herein. Each location that fails nondestructive testing shall be marked by the CQA Site Manager and repaired by the Contractor.

3. When seaming of a geomembrane is completed (or when seaming of a large area of a geomembrane is completed) and prior to placing overlying materials, the CQA Site Manager shall identify all excessive geomembrane wrinkles. The Contractor shall cut and reseam all wrinkles so identified. The seams thus produced shall be tested.

4. Repair Procedures:

a. Any portion of the geomembrane exhibiting a flaw, or failing a destructive or nondestructive test, shall be repaired by the Contractor. Several repair procedures are acceptable. The final decision as to the appropriate repair procedure shall be agreed upon between the Design Engineer and the Contractor. The procedures available include:

   i. Patching – extrusion welding a patch to repair holes larger than 1/16 inch, tears, undispersed raw materials, and contamination by foreign matter;

   ii. Abrading and re-seaming – applying an extrusion seam to repair very small sections of faulty extruded seams;

   iii. Spot seaming – applying an extrusion bead to repair minor, localized flaws such as scratches and scuffs;

   iv. Capping – extrusion welding a geomembrane cap over long lengths of failed seams; and

   v. Strip repairing – cutting out bad seams and replacing with a strip of new material seamed into place on both sides with fusion welding.

b. In addition, the following criteria shall be satisfied:

   i. Surfaces of the geomembrane that are to be repaired shall be abraded no more than 20 minutes prior to the repair;

   ii. The grind depth around the repair shall not exceed ten percent of the core geomembrane thickness;

   iii. All surfaces must be clean and dry at the time of repair;

   iv. All seaming equipment used in repair procedures must be approved by trial seaming;

   v. Any other potential repair procedures shall be approved in advance, for the specific repair, by the design engineer;

   vi. Patches or caps shall extend at least 6 inches beyond the edge of the defect, and all corners of patches and holes shall be rounded with a radius of at least 3 inches;

   vii. All ends of wrinkle or relief cuts should be cut to a rounded hole and patched or capped; and

   viii. Extrudate shall extend a minimum of 3 inches beyond the edge of the patch.

   ix. Cap strips shall not be installed on top of existing cap strips. In the event that a cap strip is required in proximity to an existing repair, the existing cap strip should be removed and a single new cap strip should be installed over the entire repair area.

   x.

5. Repair Verification:

a. Repairs shall be nondestructively tested using the methods described in Subpart 3.05.H of this Section, as appropriate. Repairs that pass nondestructive testing shall be considered acceptable repairs. Repairs that failed nondestructive or destructive testing will require the repair to be reconstructed and retested until passing test results are observed. At the discretion of the CQA Consultant, destructive testing may be required on any caps.

3.06 PROTECTION OF WORK

A. The Contractor shall protect all Work of this Section.

B. In the event of damage, the Contractor shall make repairs and replacements to the satisfaction of the CQA Consultant at the expense of the Contractor.

TABLE 02770-1
WOVEN GEOTEXTILE PROPERTIES

Properties	Test Method	Manufacturer QC Test Frequency	Required Test Values
Grab Strength (min. avg.)	ASTM D4632	1 per 100,000 sf	200 lbs
Puncture Strength (min. avg.)	ASTM D6241	1 per 100,000 sf	700 lbs
UV Resistance	ASTM D4355	1 per resin formulation	70%(1)

Notes: (1) After 500 hours of exposure.

TABLE 02770-2
60-MIL SMOOTH HDPE GEOMEMBRANE PROPERTIES

Properties	Test Method	Manufacturer QC Test Frequency	Required Test Values[9]
Thickness (min. avg.) • Lowest individual of 10 values	ASTM D5199	1 per Roll	54 mil
Density (min ave.)	ASTM D792 or ASTM D1505	1 per 200,000 lb	0.940 g/cc
Tensile Properties[1] (min. avg.) • Yield strength • Break strength • Yield elongation • Break elongation	ASTM D6693 Type IV	1 per 20,000 lb	 126 lb/in 228 lb/in 12% 700%
Tear Resistance (min. avg.)	ASTM D1004 Die C	1 per 45,000 lb	42 lbs
Puncture Resistance (min. avg.)	ASTM D4833	1 per 45,000 lb	108 lbs
Stress Crack Resistance[2]	ASTM D5397 (App.)	Per GRI-GM10	500 hr
Carbon Black Content	ASTM D4218	1 per 20,000 lb	2.0-3.0%
Carbon Black Dispersion	ASTM D5596	1 per 45,000 lb	Note 3
Oxidative Induction Time (OIT)[4] (a) Standard OIT (min avg.) or (b) High Pressure OIT (min avg.)	 ASTM D3895 ASTM D5885	1 per 200,000 lb	 100 400
Oven Aging at 85°C [4][5] (a) Standard OIT (min avg.) or (b) High Pressure OIT (min avg.)	ASTM D5721 ASTM D3895 ASTM D5885	1 per Formulation	 55% retained after 90d 80% retained after 90d
UV Resistance[6] (a) Standard OIT (min avg.) or (b) High Pressure OIT (min avg.)[8]	ASTM D7238 ASTM D3895 ASTM D5885	1 per Formulation	 N.R. (7) 50% retained after 1600 hrs

Notes:
(1) Machine direction (MD) and cross machine direction (XMD) average values should be on the basis of 5 test specimens each direction.
- Yield elongation is calculated using a gage length of 1.3 inches
- Break elongation is calculated using a gage length of 2.0 inches
(2) The yield stress used to calculate the applied load for the SP-NCTL test should be the manufacturer's mean value via MQA testing.
(3) Carbon black dispersion (only near spherical agglomerates) for 10 different views. 9 in Categories 1 or 2 and 1 in Category 3.
(4) The manufacturer has the option to select either one of the OIT methods listed to evaluation the antioxidant content in the geomembrane.
(5) It is also recommended to evaluate samples at 30 and 60 days to compare with the 90 day response.
(6) The condition of the test should be 20hr. UV cycle at 75 °C followed by 4 hr. condensation at 60°C.
(7) Not recommended since the high temperature of the Std-OIT test produces an unrealistic result for some of the antioxidants in the UV exposed sample.
(8) UV resistance is based on percent retained value regardless of the original HP-OIT value.
(9) Based on GRI GM13, Rev. 14, 1/6/16

TABLE 02770-3
60-MIL TEXTURED HDPE GEOMEMBRANE PROPERTIES

Properties	Test Method	Manufacturer QC Test Frequency	Required Test Values[9]
Thickness (min. avg.) • Lowest individual for 8 out of 10 values • Lowest individual for any of the 10 values	ASTM D5199	1 per Roll	57 mil 54 mil 51 mil
Asperity Height (min. avg.)	ASTM D7466	Every 2nd Roll	16 mil
Density (min ave.)	ASTM D792 or ASTM D1505	1 per 200,000 lb	0.940 g/cc
Tensile Properties[1] (min. avg.) • Yield strength • Break strength • Yield elongation • Break elongation	ASTM D6693 Type IV	1 per 20,000 lb	 126 lb/in 90 lb/in 12% 100%
Tear Resistance (min. avg.)	ASTM D1004 Die C	1 per 45,000 lb	42 lbs
Puncture Resistance (min. avg.)	ASTM D4833	1 per 45,000 lb	90 lbs
Stress Crack Resistance[2]	ASTM D5397 (App.)	Per GRI-GM10	500 hr
Carbon Black Content	ASTM D4218	1 per 20,000 lb	2.0-3.0%
Carbon Black Dispersion	ASTM D5596	1 per 45,000 lb	Note 3
Oxidative Induction Time (OIT)[4] (c) Standard OIT (min avg.) or (d) High Pressure OIT (min avg.)	 ASTM D3895 ASTM D5885	1 per 200,000 lb	 100 400
Oven Aging at 85°C [4][5] (c) Standard OIT (min avg.) or (d) High Pressure OIT (min avg.)	ASTM D5721 ASTM D3895 ASTM D5885	1 per Formulation	 55% retained after 90d 80% retained after 90d
UV Resistance[6] (c) Standard OIT (min avg.), or (d) High Pressure OIT (min avg.)[8]	ASTM D7238 ASTM D3895 ASTM D5885	1 per Formulation	 N.R. (7) 50% retained after 1600 hrs

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Notes:

(10) Machine direction (MD) and cross machine direction (XMD) average values should be on the basis of 5 test specimens each direction.
- Yield elongation is calculated using a gage length of 1.3 inches
- Break elongation is calculated using a gage length of 2.0 inches

(11) The yield stress used to calculate the applied load for the SP-NCTL test should be the manufacturer's mean value via MQA testing.

(12) Carbon black dispersion (only near spherical agglomerates) for 10 different views. 9 in Categories 1 or 2 and 1 in Category 3.

(13) The manufacturer has the option to select either one of the OIT methods listed to evaluation the antioxidant content in the geomembrane.

(14) It is also recommended to evaluate samples at 30 and 60 days to compare with the 90 day response.

(15) The condition of the test should be 20hr. UV cycle at 75 °C followed by 4 hr. condensation at 60°C.

(16) Not recommended since the high temperature of the Std-OIT test produces an unrealistic result for some of the antioxidants in the UV exposed sample.

(17) UV resistance is based on percent retained value regardless of the original HP-OIT value.

(18) Based on GRI GM13, Rev. 14, 1/6/16

TABLE 02770-4
MINIMUM 60-MIL HDPE SEAM PROPERTIES

Property	Qualifier	Unit	Specified Value(1)	Test Method
Shear Strength (at yield point)	Minimum	lb./in. width	120	ASTM D6392
Peel Adhesion Fusion	Minimum	lb./in. width	91	ASTM D6392
Peel Adhesion Extrusion	Minimum	lb./in. width	78	ASTM D6392

(1) Value listed for shear and peel strengths are for 4 out of 5 test specimens; the 5th specimen can be as low as 80% of the listed values

[END OF SECTION]

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Exhibit

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NOTE:
BACKGROUND MAP RETRIEVED FROM MAPQUEST 2012

LOCATION:
SECTION 15, TOWNSHIP 45 N, RANGE 12 E

ENVIRONMENTAL CONSULTATION & REMEDIATION

K P R G

KPRG and Associates, inc.

14665 West Lisbon Road, Suite 1A Brookfield, Wisconsin 53005 Telephone 262-781-0475 Facsimile 262-781-0478

414 Plaza Drive, Suite 106 Westmont, Illinois 60559 Telephone 630-325-1300 Facsimile 630-325-1593

SITE MAP

WAUKEGAN STATION
WAUKEGAN, ILLINOIS

Scale: 1" = 500' | Date: August 23, 2017

KPRG Project No. 12313.2 | FIGURE C.2-1

W:\projects\midwest generation\12313 ash pond groundwater\figures\waukegan\ccr\2020\waukegan ccr gw map 2q2020.dwg

PATRICK ENGINEERING INC.

BORING NUMBER **B-MW-1-Wa** SHEET **1** OF **2**
CLIENT **Midwest Generation**
PROJECT & NO. **21053.070**
LOCATION **Waukegan**
LOGGED BY **MPG**
GROUND ELEVATION **23.5**

ELEVATION	DEPTH (FT)	STRATA	SOIL/ROCK DESCRIPTION	SAMPLE TYPE & NO. DEPTH (FT) RECOVERY(IN)	BLOW COUNTS	Water Content PL 10 20 30 40 50 LL / Unconfined Compressive Strength (TSF) * 1 2 3 4 5	NOTES & TEST RESULTS
23.5	0.0		Brown fine sand, fine gravel, black cinders, ash FILL				
				SS-1 1.0-2.5 16"R	3 5 7		qu=NT
							Bentonite seal 2.0'-20.0'. Stickup protective cover installed.
				SS-2 3.5-5.0 18"R	6 10 13		qu=NT
			Dry				
				SS-3 6.0-7.5 14"R	6 11 16		qu=NT
			Dry	SS-4 8.5-10.0 12"R	4 9 10		qu=NT
				SS-5 11.0-12.5 16"R	2 3 3		qu=NT
10.0	13.5		Light brown fine and medium sand, dry FILL	SS-6 13.5-15.0 18"R	2 4 3		qu=NT
			Occasional black coal, cinders	SS-7 16.0-17.5 18"R	3 4 4		qu=NT
			Brown fine sand, occasional black cinders	SS-8 18.5-20.0 18"R	6 7 9		qu=NT
3.5	20.0						

DRILLING CONTRACTOR **Groff Testing**
DRILLING METHOD **4.25" I.D. HSA**
DRILLING EQUIPMENT **CME 550 ATV**
DRILLING STARTED **10/13/10** ENDED **10/13/10**

REMARKS
Installed 2" diameter PVC monitoring well.

WATER LEVEL (ft.)
▽ **23.5**
▼
▼

PATRICK ENGINEERING INC.

BORING NUMBER **B-MW-1-Wa** SHEET **2** OF **2**
CLIENT **Midwest Generation**
PROJECT & NO. **21053.070**
LOCATION **Waukegan**
LOGGED BY **MPG**
GROUND ELEVATION **23.5**

ELEVATION	DEPTH (FT)	STRATA	SOIL/ROCK DESCRIPTION	SAMPLE TYPE & NO. DEPTH (FT) RECOVERY(IN)	BLOW COUNTS	Water Content PL–LL (10 20 30 40 50) / Unconfined Compressive Strength (TSF) (1 2 3 4 5)	NOTES & TEST RESULTS
3.5	20.0		Light brown fine sand, trace medium sand, medium dense, moist				Sand pack 20.0'-32.0'
			SM	SS-9 21.0-22.5 18"R	5 8 10		qu=NT
							Set screen (slot 0.010") 22.0'-32.0'
0.0	23.5		▽ Saturated	SS-10 23.5-25.0 18"R	6 9 10		qu=NT
			Trace fine gravel				
				SS-11 26.0-27.5 18"R	5 6 12		qu=NT
				SS-12 28.5-30.0 18"R	6 9 13		qu=NT
			Fine sand, trace coarse to medium sand, medium dense, saturated				
-8.5	32.0		End of Boring at 32.0'				

DRILLING CONTRACTOR **Groff Testing**
DRILLING METHOD **4.25" I.D. HSA**
DRILLING EQUIPMENT **CME 550 ATV**
DRILLING STARTED **10/13/10** ENDED **10/13/10**

REMARKS
Installed 2" diameter PVC monitoring well.

WATER LEVEL (ft.)
▽ 23.5

PATRICK ENGINEERING INC.

BORING NUMBER **B-MW-2-Wa** SHEET **1** OF **2**
CLIENT **Midwest Generation**
PROJECT & NO. **21053.070**
LOCATION **Waukegan**

LOGGED BY **MPG**
GROUND ELEVATION **23.0**

ELEVATION	DEPTH (FT)	STRATA	SOIL/ROCK DESCRIPTION	SAMPLE TYPE & NO. DEPTH (FT) RECOVERY(IN)	BLOW COUNTS	Water Content PL–LL (10 20 30 40 50) / Unconfined Compressive Strength (TSF) ✳ (1 2 3 4 5)	NOTES & TEST RESULTS
23.0	0.0		Black coal cinders, ash, fine sand, fine gravel, gray silt FILL				
				SS-1 1.0-2.5 14"R	4 10 15		qu=NT
							Bentonite seal 2.0'-19.0'. Stickup protective cover installed.
				SS-2 3.5-5.0 14"R	8 10 23		qu=NT
			Dry				
				SS-3 6.0-7.5 14"R	12 11 16		qu=NT
				SS-4 8.5-10.0 18"R	7 12 14		qu=NT
			Dry				
12.0	11.0		Light brown fine sand, gray fine sand	SS-5 11.0-12.5 18"R	12 13 13		qu=NT
				SS-6 13.5-15.0 18"R	1 3 6		qu=NT
				SS-7 16.0-17.5 18"R	8 10 10		qu=NT
			Dry				
4.5	18.5		Light brown fine sand, trace medium sand, well graded SM	SS-8 18.5-20.0 18"R	9 12 14		qu=NT Sand pack 19.0'-30.0'

DRILLING CONTRACTOR **Groff Testing**
DRILLING METHOD **4.25" I.D. HSA**
DRILLING EQUIPMENT **CME 550 ATV**
DRILLING STARTED **10/13/10** ENDED **10/13/10**

REMARKS
Installed 2" diameter PVC monitoring well.

WATER LEVEL (ft.)
▽ 21.5

PATRICK ENGINEERING INC.

BORING NUMBER **B-MW-2-Wa** SHEET **2** OF **2**
CLIENT **Midwest Generation**
PROJECT & NO. **21053.070**
LOCATION **Waukegan**

LOGGED BY **MPG**
GROUND ELEVATION **23.0**

ELEVATION	DEPTH (FT)	STRATA	SOIL/ROCK DESCRIPTION	SAMPLE TYPE & NO. DEPTH (FT) RECOVERY(IN)	BLOW COUNTS	Water Content PL □ LL (10 20 30 40 50) / Unconfined Compressive Strength (TSF) ✳ (1 2 3 4 5)	NOTES & TEST RESULTS
3.0	20.0						Set screen (slot 0.010") 20.0'-30.0'
1.5	21.5		▽ Saturated	SS-9 21.0-22.5 18"R	6 10 11		qu=NT
			Medium dense, dry				
				SS-10 23.5-25.0 18"R	3 7 12		qu=NT
			Trace fine gravel and coarse sand				
				SS-11 26.0-27.5 18"R	4 7 13		qu=NT
				SS-12 28.5-30.0 18"R	2 8 12		qu=NT
-7.0	30.0		End of Boring at 30.0'				

DRILLING CONTRACTOR **Groff Testing**
DRILLING METHOD **4.25" I.D. HSA**
DRILLING EQUIPMENT **CME 550 ATV**
DRILLING STARTED **10/13/10** ENDED **10/13/10**

REMARKS
Installed 2" diameter PVC monitoring well.

WATER LEVEL (ft.)
▽ **21.5**
▽
▽

PATRICK ENGINEERING INC.

BORING NUMBER **B-MW-3-Wa** SHEET **1** OF **2**
CLIENT **Midwest Generation**
PROJECT & NO. **21053.070**
LOCATION **Waukegan**

LOGGED BY **MPG**
GROUND ELEVATION **23.2**

ELEVATION	DEPTH (FT)	STRATA	SOIL/ROCK DESCRIPTION		SAMPLE TYPE & NO. DEPTH (FT) RECOVERY(IN)	BLOW COUNTS	Water Content PL–LL (10 20 30 40 50) / Unconfined Compressive Strength (TSF) (1 2 3 4 5)	NOTES & TEST RESULTS
23.2	0.0		Brown silty sand, fine gravel, black coal cinders, ash	FILL	SS-1 1.0-2.5 16"R	7 13 16		qu=NT
			Dry		SS-2 3.5-5.0 18"R	9 16 18		Bentonite seal 2.0'-19.0'. Stickup protective cover installed. qu=NT
			Gray silt, cinders, ash, sand		SS-3 6.0-7.5 14"R	15 20 26/4.5"		qu=NT
					SS-4 8.5-10.0 18"R	9 16 18		qu=NT
					SS-5 11.0-12.5 18"R	6 10 12		qu=NT
					SS-6 13.5-15.0 18"R	3 4 9		qu=NT
			Light brown fine sand					
			Black coarse coal cinders		SS-7 16.0-17.5 18"R	7 7 9		qu=NT
4.7	18.5		Light brown fine sand	SM	SS-8 18.5-20.0 18"R	6 7 12		Sand pack 19.0'-20.0'
3.2	20.0							

DRILLING CONTRACTOR **Groff Testing**
DRILLING METHOD **4.25" I.D. HSA**
DRILLING EQUIPMENT **CME 550 ATV**
DRILLING STARTED **10/13/10** ENDED **10/13/10**

REMARKS
Installed 2" diameter PVC monitoring well.

WATER LEVEL (ft.)
▽ **21.0**
▽
▽

PATRICK ENGINEERING INC.

BORING NUMBER **B-MW-3-Wa** SHEET **2** OF **2**
CLIENT **Midwest Generation**
PROJECT & NO. **21053.070**
LOCATION **Waukegan**

LOGGED BY **MPG**
GROUND ELEVATION **23.2**

ELEVATION	DEPTH (FT)	STRATA	SOIL/ROCK DESCRIPTION	SAMPLE TYPE & NO. DEPTH (FT) RECOVERY(IN)	BLOW COUNTS	Water Content PL □ ○ △ LL (10 20 30 40 50) / Unconfined Compressive Strength (TSF) ✳ (1 2 3 4 5)	NOTES & TEST RESULTS
3.2	20.0		Light brown fine sand, trace medium sand, well graded, medium dense				Set screen (slot 0.010") 20.0'-30.0'
2.2	21.0		▽ SM Saturated	SS-9 21.0-22.5 18"R	4 6 10		qu=NT
			Trace fine gravel	SS-10 23.5-25.0 18"R	4 6 10		qu=NT
				SS-11 26.0-27.5 18"R	6 7 16		qu=NT
				SS-12 28.5-30.0 18"R	6 12 14		qu=NT
-6.8	30.0		End of Boring at 30.0'				

DRILLING CONTRACTOR **Groff Testing**
DRILLING METHOD **4.25" I.D. HSA**
DRILLING EQUIPMENT **CME 550 ATV**
DRILLING STARTED **10/13/10** ENDED **10/13/10**

REMARKS
Installed 2" diameter PVC monitoring well.

WATER LEVEL (ft.)
▽ **21.0**
▼
▼

PATRICK ENGINEERING INC.

BORING NUMBER **B-MW-4-Wa** SHEET **1** OF **2**
CLIENT **Midwest Generation**
PROJECT & NO. **21053.070**
LOCATION **Waukegan**
LOGGED BY **MPG**
GROUND ELEVATION **23.6**

ELEVATION	DEPTH (FT)	STRATA	SOIL/ROCK DESCRIPTION	SAMPLE TYPE & NO. DEPTH (FT) RECOVERY(IN)	BLOW COUNTS	Water Content PL 10 20 30 40 50 LL; Unconfined Compressive Strength (TSF) * 1 2 3 4 5	NOTES & TEST RESULTS
23.6	0.0		Dark brown silt, coarse gravel, black coal cinders, dry				
			FILL	SS-1 1.0-2.5 18"R	6 13 19		qu=NT
							Bentonite seal 2.0'-19.0'. Stickup protective cover installed.
				SS-2 3.5-5.0 17"R	8 24 21		qu=NT
				SS-3 6.0-7.5 6"R	13 31/4"		qu=NT
			Wood, gray silt, cinders, dry	SS-4 8.5-10.0 18"R	14 26 26		qu=NT
				SS-5 11.0-12.5 18"R	11 14 13		qu=NT
			Some medium sand				
			Cinders mixed with brown fine sand	SS-6 13.5-15.0 18"R	5 8 8		qu=NT
				SS-7 16.0-17.5 18"R	7 10 12		qu=NT
5.1	18.5		Light brown fine sand, well graded, medium dense	SS-8 18.5-20.0 18"R	7 11 13		qu=NT Sand pack 19.0'-30.0'
			SM				

DRILLING CONTRACTOR **Groff Testing**
DRILLING METHOD **4.25" I.D. HSA**
DRILLING EQUIPMENT **CME 550 ATV**
DRILLING STARTED **10/12/10** ENDED **10/12/10**

REMARKS
Installed 2" diameter PVC monitoring well.

WATER LEVEL (ft.)
▽ 23.0
▽
▽

PATRICK ENGINEERING INC.

BORING NUMBER **B-MW-4-Wa** SHEET **2** OF **2**
CLIENT **Midwest Generation**
PROJECT & NO. **21053.070**
LOCATION **Waukegan**
LOGGED BY **MPG**
GROUND ELEVATION **23.6**

ELEVATION	DEPTH (FT)	STRATA	SOIL/ROCK DESCRIPTION	SAMPLE TYPE & NO. DEPTH (FT) RECOVERY(IN)	BLOW COUNTS	Water Content PL–LL (10 20 30 40 50) / Unconfined Compressive Strength (TSF) * (1 2 3 4 5)	NOTES & TEST RESULTS
3.6	20.0						Set screen (slot 0.010") 20.0'-30.0'
			Moist	SS-9 21.0-22.5 18"R	4 6 6		qu=NT
0.6	23.0		▽ Saturated				
				SS-10 23.5-25.0 18"R	4 4 8		qu=NT
				SS-11 26.0-27.5 18"R	8 8 10		qu=NT
			Trace fine gravel, trace coarse sand	SS-12 28.5-30.0 18"R	7 8 12		qu=NT
-6.4	30.0		End of Boring at 30.0'				

DRILLING CONTRACTOR **Groff Testing**
DRILLING METHOD **4.25" I.D. HSA**
DRILLING EQUIPMENT **CME 550 ATV**
DRILLING STARTED **10/12/10** ENDED **10/12/10**

REMARKS
Installed 2" diameter PVC monitoring well.

WATER LEVEL (ft.)
▽ 23.0

PATRICK ENGINEERING INC.

BORING NUMBER **B-MW-5-Wa** SHEET **1** OF **2**
CLIENT **Midwest Generation**
PROJECT & NO. **21053.070**
LOCATION **Waukegan**

LOGGED BY **MPG**
GROUND ELEVATION **21.5**

ELEVATION	DEPTH (FT)	STRATA	SOIL/ROCK DESCRIPTION	SAMPLE TYPE & NO. DEPTH (FT) RECOVERY(IN)	BLOW COUNTS	Water Content PL 10 20 30 40 LL 50 / Unconfined Compressive Strength (TSF) * 1 2 3 4 5	NOTES & TEST RESULTS
21.5	0.0		Dark brown silty clay topsoil				
21.0	0.5		FILL				
			Black coal cinders, medium sand	SS-1 1.0-2.5 14"R	6 10 10		qu=NT
			FILL				Bentonite seal 2.0'-18.0'. Stickup protective cover installed.
			Dry	SS-2 3.5-5.0 14"R	4 6 5		qu=NT
				SS-3 6.0-7.5 16"R	2 6 8		qu=NT
			Brown fine to medium sand, with black coal cinders				
			Loose	SS-4 8.5-10.0 18"R	2 2 2		qu=NT
			Brick	SS-5 11.0-12.5 18"R	1 2 1		qu=NT
			Moist				
			Black coal cinders	SS-6 13.5-15.0 17"R	1 2 1		qu=NT
			Dark gray silt	SS-7 16.0-17.5 18"R	4 2 2		qu=NT
4.5	17.0		Gray medium sand, black coal cinders				
			Gray fine sand, trace medium to coarse sand, well graded, loose to medium dense, saturated				Sand pack 18.0'-30.0' Set screen (slot 0.010") 18.5'-28.5'
			SM	SS-8 18.5-20.0	4 4 5		

DRILLING CONTRACTOR **Groff Testing**
DRILLING METHOD **4.25" I.D. HSA**
DRILLING EQUIPMENT **CME 550 ATV**
DRILLING STARTED **10/12/10** ENDED **10/12/10**

REMARKS
Installed 2" diameter PVC monitoring well.

WATER LEVEL (ft.)
▽ 21.0
▼
▼

PATRICK ENGINEERING INC.

BORING NUMBER **B-MW-5-Wa** SHEET **2** OF **2**
CLIENT **Midwest Generation**
PROJECT & NO. **21053.070**
LOCATION **Waukegan**

LOGGED BY **MPG**
GROUND ELEVATION **21.5**

ELEVATION	DEPTH (FT)	STRATA	SOIL/ROCK DESCRIPTION	SAMPLE TYPE & NO. DEPTH (FT) RECOVERY(IN)	BLOW COUNTS	Water Content PL–LL (10 20 30 40 50) / Unconfined Compressive Strength (TSF) ✳ (1 2 3 4 5)	NOTES & TEST RESULTS
1.5	20.0						
0.5	21.0		▽				
			Gray fine gravel, coarse sand, poorly graded, medium dense, saturated GP	SS-9 21.0-22.5 16"R	5 7 8		qu=NT
				SS-10 23.5-25.0 18"R	6 9 8		qu=NT
-4.5	26.0		Gray fine sand, trace medium sand, trace fine gravel, well graded, medium dense SM	SS-11 26.0-27.5 16"R	6 8 13		qu=NT
				SS-12 28.5-30.0 18"R	7 10 13		qu=NT
-8.5	30.0		End of Boring at 30.0'				

DRILLING CONTRACTOR **Groff Testing**
DRILLING METHOD **4.25" I.D. HSA**
DRILLING EQUIPMENT **CME 550 ATV**
DRILLING STARTED **10/12/10** ENDED **10/12/10**

REMARKS
Installed 2" diameter PVC monitoring well.

WATER LEVEL (ft.)
▽ **21.0**

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ENVIRONMENTAL CONSULTATION & REMEDIATION
KPRG and Associates, Inc

Midwest Generation, LLC
Waukegan Station
Waukegan, Illinois

Project No. 18311.31

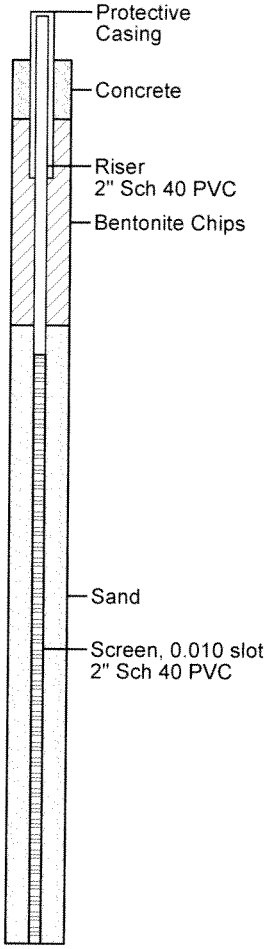
GEOLOGIC LOG OF MW-6

Date Started	: 11/19/2012
Date Well Set	: 11/19/2012
Rock Coring Tools	: Not cored
Drilling Tools	: 4.25 ID HSA
Drill Rig	: Geoprobe
Driller Name/Co	: T. Brown/Cabeno

Total Boring Depth	: 20 feet
Well Bottom Depth	: 15 feet
Surface Elev.	: 586.75 feet above MSL
TOC Elev.	: 589.73 feet above MSL
Groundwater Elev.	: 580.89 feet above MSL
Riser Material	: 2" Sch 40 PVC
Screen Material	: 2" Sch 40 PVC, 0.010 slot
Coordinate N	: 42 22' 36.90" N
Coordinate E	: 087 49' 6.7" W
Logged By	: P. Allenstein

Depth in Feet	Surf. Elev. 586.75	DESCRIPTION	% PID	% Recovery
0		FILL: Dark brown silty clay, slightly moist	0	
2	585		0	
		FILL: Brown to dark brown fine SILTY SAND, moist	0	
4	583	Black SILTY CLAY, organics, slightly moist	0	
			0	80
6	581	Brown medium to fine grained SILTY SAND	0	
		- Wet	0	
8	579			
			0	80
10	577			
			0	
12	575			
			0	100
14	573			
		- Some coarse sand	0	
16	571			
			0	80
18	569			
			0	
20	567	End of Geoprobe boring at 20', end HSA boring at 15'		
22	565			

Well Diagram: MW-6



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GEOLOGIC LOG OF MW-7

(Page 1 of 1)

Midwest Generation, LLC
Waukegan Station
Waukegan, Illinois

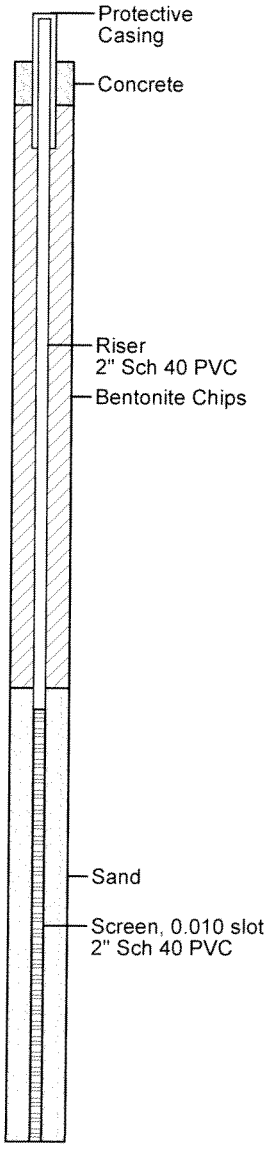
Project No. 18311.31

Date Started	: 11/19/2012
Date Well Set	: 11/19/2012
Rock Coring Tools	: Not cored
Drilling Tools	: 4.25 ID HSA
Drill Rig	: Geoprobe
Driller Name/Co	: T. Brown/Cabeno

Total Boring Depth	: 25 feet
Well Bottom Depth	: 25 feet
Surface Elev.	: 595.87 feet above MSL
TOC Elev.	: 598.29 feet above MSL
Groundwater Elev.	: 579.57 feet above MSL
Riser Material	: 2" Sch 40 PVC
Screen Material	: 2" Sch 40 PVC, 0.010 slot
Coordinate N	: 42 22' 34.00" N
Coordinate E	: 087 48' 59.70" W
Logged By	: P. Allenstein

Depth in Feet	Surf. Elev. 595.87	DESCRIPTION	PID	% Recovery
0		FILL: Brown to dark brown clay approximately 3" thick	0	
		FILL: Black medium grained sand with some reddish and gray layers, some silty layers, slightly moist	0	
2	594		0	
			0	
4	592		0	80
		FILL: Tan fine to medium grained sand with thin black layers	0	
6	590		0	
			0	
8	588		0	80
10	586	FILL: Gray silt with thin banding light to dark, slightly moist		
		Black CLAYEY SILT with organics, soft, wet	0	
12	584		0	100
14	582	Brown fine to medium grained SAND with traces of silt, slightly moist	0	
16	580	- Some gravel	0	80
18	578	- Wet	0	
20	576	- Some coarse gravel	0	
22	574	- Some coarse gravel	0	
24	572			
26	570	End of boring at 25'		
28	568			
30	566			

Well Diagram: MW-7



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KPRG and Associates, Inc.

Midwest Generation, LLC
Waukegan Station
Waukegan, Illinois

Project No. 20013

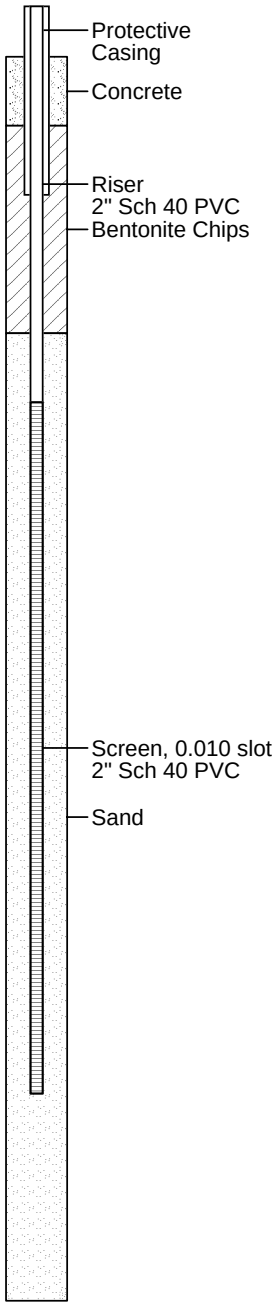
GEOLOGIC LOG OF MW-8

Date Started	: 04/29/2014
Date Well Set	: 04/29/2014
Rock Coring Tools	: Not cored
Drilling Tools	: 4.25 ID HSA
Drill Rig	: Geoprobe
Driller Name/Co	: J. Martin/TSC

Total Boring Depth	: 18 feet
Well Bottom Depth	: 15 feet
Surface Elev.	: 588.42 feet above MSL
TOC Elev.	: 590.99 feet above MSL
Groundwater Elev.	: feet above MSL
Riser Material	: 2" Sch 40 PVC
Screen Material	: 2" Sch 40 PVC, 0.010 slot
Coordinate N	: 2080826 N
Coordinate E	: 1123351 E
Logged By	: P. Allenstein

Depth in Feet	Surf. Elev. 588.42	DESCRIPTION	PID	% Recovery
0		Grass, Black clayey TOP SOIL		
		FILL: Gray SILT with traces fine sand, very moist		100
2	586			
		FILL: Brown SILT with black sandy SLAG layered		100
4	584	FILL: Greenish gray SILTY SAND - thin slag layer		
		Black SILT and CLAY, wet		100
6	582			
				100
		6" PEAT		
8	580	Gray SILTY SAND, fine to coarse grained, wet		
				50
10	578			
				50
12	576			
				50
14	574	Brown SILTY SAND, fine to medium grained		
				50
16	572			
				50
18	570	End of Boring at 18'		

Well Diagram: MW-8



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KPRG and Associates, Inc.

Midwest Generation, LLC
Waukegan Station
Waukegan, Illinois

Project No. 20013

GEOLOGIC LOG OF MW-9

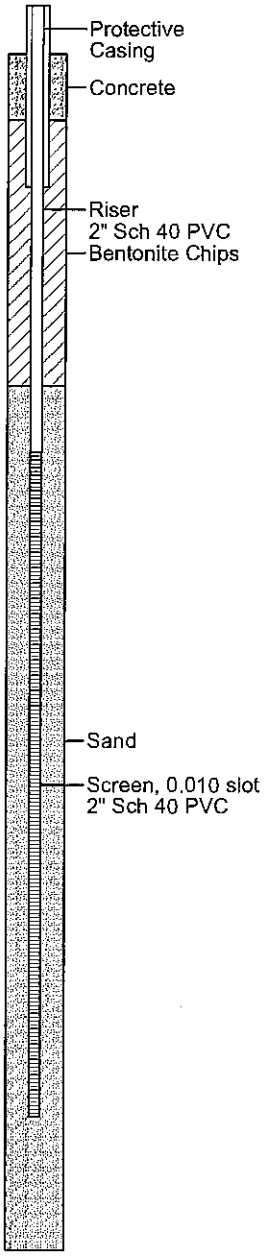
(Page 1 of 1)

Date Started	: 04/29/2014
Date Well Set	: 04/29/2014
Rock Coring Tools	: Not cored
Drilling Tools	: 4.25 ID HSA
Drill Rig	: Geoprobe
Driller Name/Co	: J. Martin/TSC

Total Boring Depth	: 18 feet
Well Bottom Depth	: 16 feet
Surface Elev.	: 591.58 feet above MSL
TOC Elev.	: 594.09 feet above MSL
Groundwater Elev.	: feet above MSL
Riser Material	: 2" Sch 40 PVC
Screen Material	: 2" Sch 40 PVC, 0.010 slot
Coordinate N	: 2081118 N
Coordinate E	: 1123540 E
Logged By	: P. Allenstein

Depth in Feet	Surf. Elev. 591.58	DESCRIPTION	PID	% Recovery
0		FILL: Black CLAY/SILT/fine grained SAND mix, moist		
		FILL: Gray SILT, dry		100
	590			
2				
				75
	588			
4		- Begin dark gray		
				75
	586			
6		FILL: Black SLAG		
				100
	584			
8				
				100
	582			
10		PEAT, black SILTY CLAY with organics, wet		
		Light gray SILTY SAND, fine to medium grained with trace coarse grained, organics		100
	580			
12				
		Brown SILTY SAND, fine to medium grained with trace coarse grained		
	578			
14				
	576			
16				
	574			
18		End of Boring at 18'		

Well Diagram: MW-9



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KPRG and Associates, Inc.

Midwest Generation, LLC
Waukegan Station
Waukegan, Illinois

GEOLOGIC LOG OF MW-16

Date Started	: 10/20/2015
Date Well Set	: 10/20/2015
Rock Coring Tools	: Not cored
Drilling Tools	: 4.25 ID HSA
Drill Rig	: Geoprobe
Driller Name/Co	: N. Vissman / Cabeno

Total Boring Depth	: 35 feet
Well Bottom Depth	: 30.4 feet
Surface Elev.	: 604.52 feet above MSL
TOC Elev.	: 607.41 feet above MSL
Groundwater Elev.	: feet above MSL
Riser Material	: 2" Sch 40 PVC
Screen Material	: 2" Sch 40 PVC, 0.010 slot
Coordinate N	: 2080069.664
Coordinate E	: 1124344.912
Logged By	: P. Allenstein

Depth in Feet	Surf. Elev. 604.52	DESCRIPTION	PID	% Recovery
0	604	FILL: Dark Brown Clayey Top Soil, dry.		
		FILL: Brown SAND/SILT/GRAVEL mix, dry.		
2	602	FILL: Brown SILTY SAND, slightly moist.		75
		FILL: Brown and Dark Gray SILT, and FINE SAND, some cinders, slightly moist.		
4	600			
6	598			
8	596			100
		FILL: Orange Brown SILTY SAND, medium grained, slightly moist.		
10	594			
		FILL: Dark Brown to Black SAND, fine to medium, cinders, trace silt, slightly moist.		
12	592			100
14	590			
16	588	FILL: Tan SILTY SAND, with Gray SILT layers, slightly moist.		
		FILL: Gray SILT, some black, very moist.		75
18	586	FILL: Black SAND, fine to medium, cinders, slightly moist.		
20	584			
22	582			10
24	580	Brown SILTY SAND, fine to medium, moist.		
26	578			
28	576			10
30	574	End of Boring at 30'		
32	572			
34				

Well Diagram: MW-16

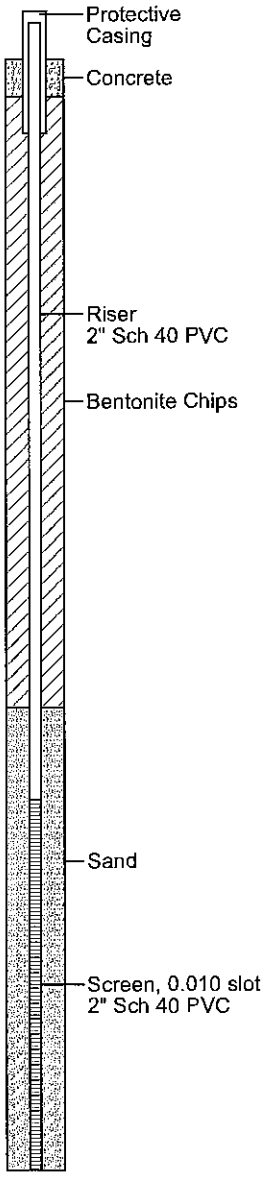

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Exhibit

47

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SUMMARY LETTER

October 13, 2005

Ms. Maria L. Race
Midwest Generation EME, LLC
One Financial Place
440 South LaSalle Street, Suite 3500
Chicago, Illinois 60605

VIA FEDERAL EXPRESS

KPRG Project No. 15805

Re: Geotechnical Analysis of Soil Surrounding Settling Basins/Ponds

Dear Ms. Race:

KPRG and Associates, Inc. (KPRG) has recently received the geotechnical testing results from the soil boring program implemented in the vicinity of various ponds located at six of the Midwest Generation stations. Specifically, these stations and the number of borings advanced at each were:

- Waukegan Station (5 borings)
- (
- Will County Station (5 borings)
- Joliet #29 Station (6 borings)
- Joliet #9 Station (3 borings)
- Powerton Station (9 borings)

This letter report provides a project objective, documents the field procedures, identifies the geotechnical laboratory specifications and summarizes the geotechnical testing results. Each item is discussed separately below.

PROJECT OBJECTIVE

Based on discussions with Midwest Generation, the objective of the project was to obtain stratigraphic and geotechnical data from the vicinity of specific ponds at the various station locations. The results of the investigation would provide a physical characteristic data base for subsequent engineering evaluations, planning and decision analysis. The soil sample collection for geotechnical analysis was targeted for the approximate equivalent base elevation of each pond as specified by Midwest Generation.

FIELD PROCEDURES

Prior to mobilizing for drilling activities, Midwest Generation contracted Lucky Locators, Inc. to provide utility clearance at each pre-established drilling location. Once the utility clearance was provided, KPRG mobilized a geoprobe rig which utilizes a direct hydraulic push technology for collecting soil cores. Continuous 5-foot core samples were collected during drilling at each location. The core samples were screened in the filed for total organic vapors with a photoionization detector (PID) and where appropriate, compressive strength readings were taken using a hand penetrometer. At the approximate base elevation of the adjoining pond, an attempt was made to push a Shelby Tube for collection of an undisturbed sample for subsequent geotechnical analysis. If the subsurface conditions did not allow for sample collection by pushing a Shelby Tube, an acetate core sample was collected for submittal for geotechnical analysis. If the targeted interval consisted of sufficiently coarse material that would not allow for either proper Shelby Tube or acetate core sampling, a representative volume of retrieved sample was placed into a plastic baggie for submittal for geotechnical analysis. Table 1 summarizes the overall results of the geotechnical sampling effort relative to station, sample identification number, sample collection type and depth.

Upon completion of sampling at each location, the boring was abandoned by placing unsampled core material back into the hole and filling the remainder of the boring with granular bentonite. A surface patch was then placed to match the surrounding surficial material.

GEOTECHNICAL LABORATORY SPECIFICATIONS

KPRG subcontracted Terracon Consulting Engineers (Terracon) to perform the geotechnical laboratory analyses. The following geotechnical testing methods were run by Terracon:

- Grain Size with Hydrometer (ASTM Method D 422)
- Atterberg Limits (ASTM Method D 4318)
- Bulk Density (ASTM Method D 2937)
- Specific Gravity (ASTM Method D 854)
- Moisture Content (ASTM Method D 2216)
- Permeability (ASTM Method D 5084)
- USCS Soil Classification

In accordance with KPRG's proposal, Terracon was instructed to first run the Grain Size Distribution and Atterberg Limits testing. Based on these results, permeability testing was only performed if the Plasticity Index (PI) was less than 11 or if there was less than a 30% fraction passing the 200 mesh sieve. If both of these criteria were met (i.e., a PI of greater than 11 and greater than 30% fraction passing the 200 mesh sieve), the material should have a permeability in the order of 10^{-7} cm/sec which should provide sufficient

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information for most desk-top engineering evaluations. As noted further below, only a few of the samples actually met these criteria.

It is noted that geoprobe acetate tube and/or baggie samples are not considered "undisturbed" samples and that some remolding/recompaction was required for completing permeability tests.

RESULTS

Table 1 summarizes the various samples collected for geotechnical analysis by station location and depth interval. The table notes whether the sample sent to the laboratory was a Shelby Tube, acetate tube or baggie sample.

The results of the geotechnical investigation program are organized separately for specific stations and provided in Attachments 1 through 6 along with sample location maps. A brief summary for each station is provided below. The complete geotechnical laboratory report is provided in Attachment 7.

Waukegan Station

A total of five borings were drilled and sampled at the Waukegan Station (WS-GT-1 through WS-GT-5). The approximate sample locations are provided on Figure 1-1 in Attachment 1 along with the results of the geotechnical testing in Table 1-1 and the associated soil boring logs.

A review of the boring logs indicates that the subsurface materials were generally sandy with some gravel and/or silts and clays. Some areas were noted to containing fill material generally consisting of ash/slag.

The geotechnical data in Table 1-1 from samples collected at elevations approximately equivalent to the base of the various adjacent ponds (as determined by Midwest Generation) also document these materials to be classified as sands with some gravel, silt and/or clay. Permeabilities were found to range from 1.0×10^{-3} cm/sec to 2.3×10^{-2} cm/sec. These permeabilities are consistent with sandy/gravelly materials.

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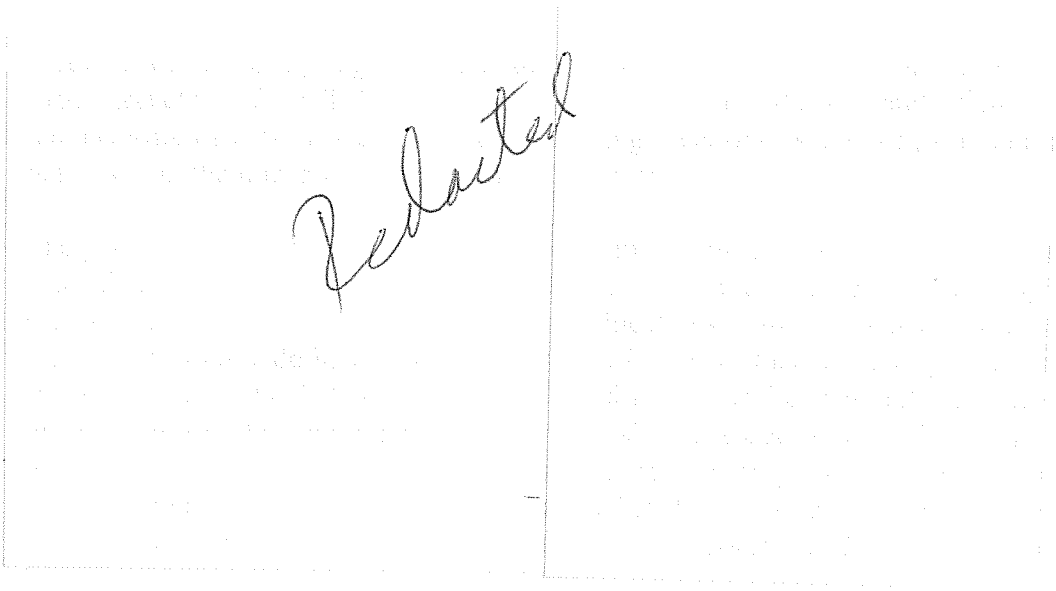

Will County Station

A total of five borings were drilled and sampled at the Will County Station (WC-GT-1 through WC-GT-5). The approximate sample locations are provided on Figure 3-1 in Attachment 3 along with the results of the geotechnical testing in Table 3-1 and the associated soil boring logs.

A review of the boring logs indicates that the subsurface stratigraphy varied across the site. The northern most boring (WC-GT-1) has a sandy/gravelly unit overlying a clay unit with weathered bedrock being encountered between 4.5 and 5 feet below ground surface (bgs). Borings WC-GT-2 through WC-GT-4 located on the west central portion of the property generally had a 1.5 to 2.5 foot thick fill layer with ash/slag and underlying sandy and gravelly units. Bedrock was generally encountered at around 10 feet bgs. The southern most boring (WC-GT-5) had a silty/sandy/gravelly layer overlaying weathered bedrock which was encountered at about 2.5 feet bgs.

The geotechnical data in Table 3-1 from samples collected at elevations approximately equivalent to the base of the various adjacent ponds (as determined by Midwest Generation) also document these materials to be classified as sands with some gravel or silts/clays. Permeabilities for the clayey and silty materials at borings WC-GT-4 and WC-GT-3 were estimated to range from 3.65×10^{-7} cm/sec to 1.86×10^{-6} cm/sec, respectively. It is noted, however, that the remolding for these samples could not meet the analytical method standard requirements due to the coarse fractions and that the values provided a verbal estimates. The true values could not be quantified due to the noted remolding issue and, therefore, are not included in the formal quantified results table provided by the geotechnical laboratory in Attachment 7. The coarser sandy and/or gravelly materials at locations WC-GT-2 and WC-GT-1 showed permeabilities at 4.02×10^{-3} and 1.35×10^{-1} cm/sec, respectively. The permeability for sample WC-GT-5 could not be run due to the relative amount of gravel which precluded being able to properly

remold a sample for the permeability analysis. This of itself suggests a relatively high permeability layer.

Joliet Station #29

A total of six borings were drilled and sampled at Joliet Station #29 (JS29-GT-1, through JS29-GT-6). The approximate sample locations are provided on Figure 4-1 in Attachment 4 along with the results of the geotechnical testing in Table 4-1 and the associated soil boring logs.

A review of the boring logs indicates that the subsurface stratigraphy varied across the site from primarily sand/gravel at location JS29-GT-1 to primarily clay at locations JS29-GT-3, JS29-GT-5 and JS29-GT-6. The boring logs for the remaining locations indicate an interlayering of the coarse and fine materials. Some minor amounts of ash/slag were noted at some locations within the upper foot of material. Bedrock was definitively encountered only at location JS29-GT-6 at a depth of approximately 15 feet bgs.

The geotechnical data in Table 4-1 from samples collected at elevations approximately equivalent to the base of the various adjacent ponds (as determined by Midwest Generation) indicates that the sample from location JS29-GT-6 met the previously defined criteria of a high PI (greater than 11) and greater than a 30% fraction passing the 200 mesh sieve. Therefore, it can be generally assumed that the materials are of low permeability as previously discussed and no further permeability testing was performed on this sample. The results of the permeability tests for locations JS29-GT-1, JS29-GT-3 and JS29-GT-5 ranged from 4.7×10^{-4} to 2.96×10^{-2} cm/sec. The permeabilities for samples JS29-GT-2 and JS29-GT-4 could not be run due to the relative amount of gravel which precluded being able to properly remold a sample for the permeability analysis. This of itself suggests relatively high permeability layers at those locations.

Joliet Station #9

A total of three borings were drilled and sampled at Joliet Station #9 (JS9-GT-1, through JS9-GT-3). The approximate sample locations are provided on Figure 5-1 in Attachment 5 along with the results of the geotechnical testing in Table 5-1 and the associated soil boring logs.

A review of the boring logs indicates that the subsurface stratigraphy varied across the site. Location JS9-GT-1 showed interlayerd gravel/sand and clay with the bottom three feet of the boring being silty sand. Location JS9-GT-2 showed primarily silty and silty sand material with some gravel. A peat layer was also encountered in the bottom three feet of the boring. Location JS9-GT-3 had primarily sandy and gravelly materials to its total depth of 15 feet bgs. A slag layer was logged between approximately 4 and 6 feet bgs.

The geotechnical data in Table 5-1 from samples collected at elevations approximately equivalent to the base of the various adjacent ponds (as determined by Midwest Generation) also document these materials to be rather coarse with high permeabilities.

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The permeability for location JS9-GT-2 was determined to be 2.73 X 10^{-2} cm/sec. The permeabilities for samples JS9-GT-1 and JS9-GT-3 could not be run due to the relative amount of gravel which precluded being able to properly remold a sample for the permeability analysis. This of itself suggests relatively high permeability layers at those locations.

Powerton Station

A total of nine borings were drilled and sampled at Powerton Station (PS-GT-1, through PS-GT-9). The approximate sample locations are provided on Figure 6-1 in Attachment 6 along with the results of the geotechnical testing in Table 6-1 and the associated soil boring logs.

A review of the boring logs indicates a varied stratigraphy from primarily clayey at locations PS-GT-1 and PS-GT-5 to an interlayering of sandy and clayey units at the other locations. It is noted that at locations PS-GT-7 through PS-GT-9, a slag/ash unit was logged starting at between 2 and 3 feet bgs and extending to approximately 15 feet bgs. A two foot ash layer was also logged between 2 and 4 feet bgs at location PS-GT-5.

The geotechnical data from samples collected at elevations approximately equivalent to the base of the various adjacent ponds (as determined by Midwest Generation) indicates that the sample from location PS-GT-5 met the previously defined criteria of a high PI (greater than 11) and greater than a 30% fraction passing the 200 mesh sieve. Therefore, it can be generally assumed that the materials are of low permeability as previously discussed and no further permeability testing was performed on this sample. The remaining permeabilities ranged from 1.6 X 10^{-7} cm/sec to 2.31 X 10^{-2} cm/sec; the lower permeabilities associated with clayey and silty soils and the higher values associated with sandier soils.

KPRG appreciates the opportunity for providing our technical services to Midwest Generation on this project. If there are any questions, please contact me at 262-781-0475.

Sincerely,
KPRG and Associates, Inc.

Richard R. Gnat

Richard R. Gnat, P.G.
Principal

TABLE

Table 1. Summary of Samples Collected for Geotechnical Analysis

STATION	BORING ID	SHELBY TUBE (Depth Ft)	GEOPROBE TUBE (Depth Ft)	BAGGIE SAMPLE
Waukegan	WS-GT-1		5-10	
	WS-GT-2	7.5-10	5-10	
	WS-GT-3		5-10	
	WS-GT-4		22-27	
	WS-GT-5		22-27	
Will County	WC-GT-1		5-10	
	WC-GT-2		5-10	
	WC-GT-3		3-8	3-8
	WC-GT-4		5-10	
	WC-GT-5		5-9	5-9
Joliet #29	JS29-GT-1		19-24	15-19
	JS29-GT-2		19-24	
	JS29-GT-3		19-24	17-19
	JS29-GT-4		17-22	
	JS29-GT-5		9-14	
	JS29-GT-6		11-14	11-14
Joliet #9	JS9-GT-1		7-12	7-10
	JS9-GT-2		7-11.5	7-10
	JS9-GT-3		8-13	8-11
Powerton	PS-GT-4	10-11.5		
	PS-GT-5	17-19		
	PS-GT-6		15-20	
	PS-GT-7		10-15	
	PS-GT-8		10-13	
	PS-GT-9		13-18	

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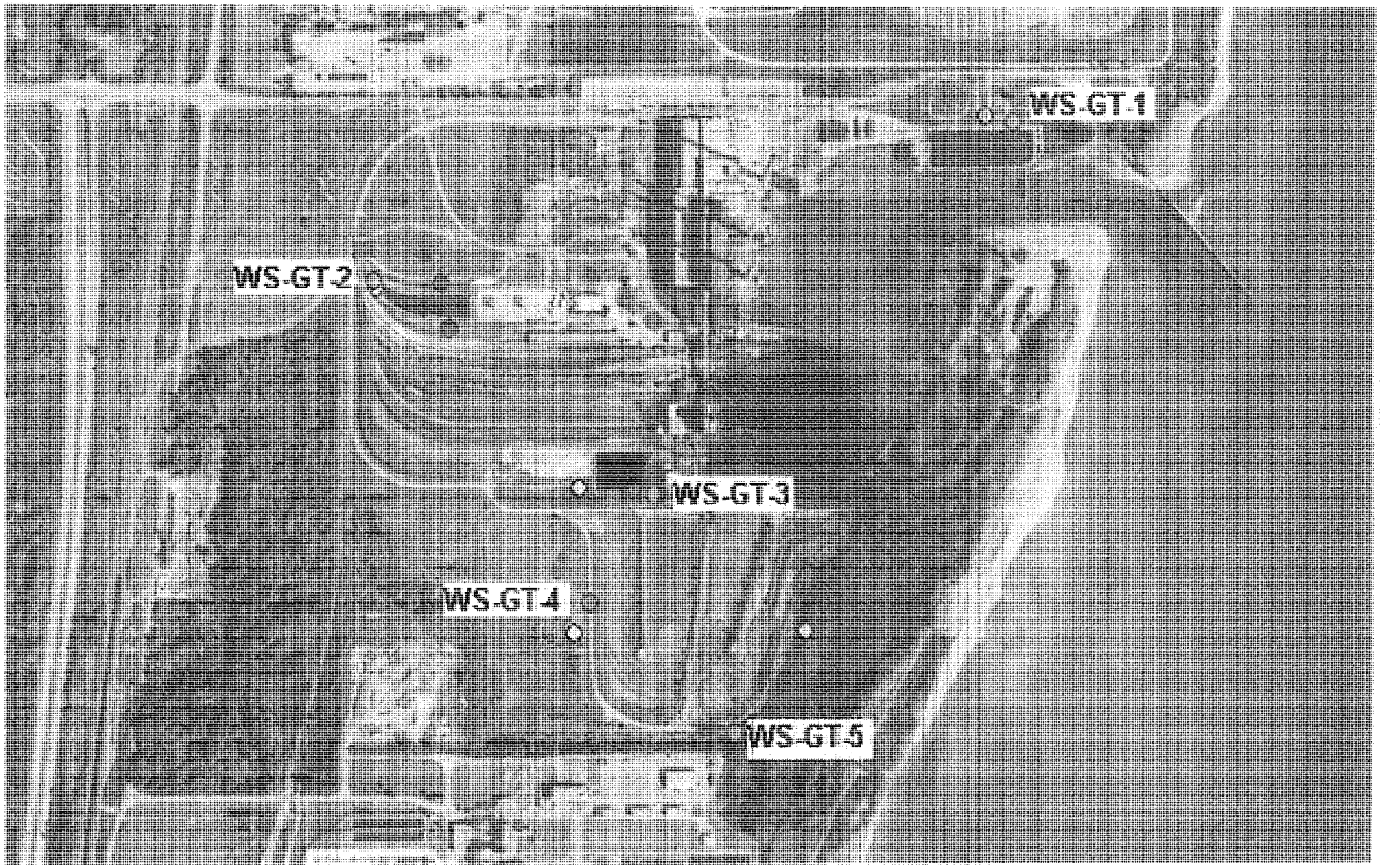
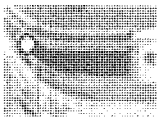
ATTACHMENT 1
Waukegan Station Geotechnical Study Results





Suggested

Possible Alternate

Soil Sample Sites cleared by Lucky Locators Inc.

Figure 1-1

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Table 1-1. Soil Sample Geotechnical Data - Midwest Generation, Waukegan Station, Waukegan, IL

Sample	Depth	Soil Description	Moisture (%)	Density (pcf)	Atterberg		Grain Size #40	Hydrometer (% passing #200)	Specific Gravity	Permeability Test (cm/s)
					LL (%)	PI (%)				
WS-GT-1	5 to 10'	Sand with trace gravel	5.6	114	NP	NP	94	1	2.63	1.05x10-2
WS-GT-2	7.5'-10'	Silty Sand, trace gravel, dark brown	15.2	107	NP	NP	79	7	2.44	1.52x10-2
			18.1							
WS-GT-3	5 to 10'	Sand with trace gravel	11.2	99	NP	NP	86	0	2.65	2.3x10-2
WS-GT-4	22-27'	Sand with trace gravel	5.4	114	NP	NP	53	2	2.64	2.16x10-2
WS-GT-5	22-27'	Sand, trace gravel, black	4.4	96	NP	NP	15	0	2.73	1.0x10-3
		(Bottom Ash?)								

*Unable to perform permeability test, too much stone, not enough soil sample
**Remolded sample to obtain the dry density
NA - Not Analyzed
NP - Not Plastic

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LOG OF BORING WS-GT-1

Midwest Generation
Waukegan Station
Waukegan, IL

Project No. 15805

Date Completed : 08/08/05
Drilling Method : Direct-Push
Drilling Company : CABENO Env. Field Services
Operator : D. Joyce
Logged By : P. Allenstein

Depth in Feet	USCS	GRAPHIC	DESCRIPTION	PID Screening	PID (ppm)	% Recovery	Compressive Strength
0–1	GW		SAND and GRAVEL, gray and orange brown. Dry.	1	0.0		
1–3	SP		SLAG, black, medium to coarse sand and gravel, some bottom ash. Dry.	2	0.0	80	
3–5	SP		SAND, fine to medium, light brown, trace silt. Slightly Moist.				
5–10			Push Geoprobe Tube 5 to 10.				
10			End of boring at 10 feet.				

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LOG OF BORING WS-GT-2

Midwest Generation
Waukegan Station
Waukegan, IL

Project No. 15805

Date Completed : 08/08/05
Drilling Method : Direct-Push
Drilling Company : CABENO Env. Field Services
Operator : D. Joyce
Logged By : P. Allenstein

Depth in Feet	USCS	GRAPHIC	DESCRIPTION	PID Screening	PID (ppm)	% Recovery	Compressive Strength
0–1	GW		SAND and GRAVEL, brown and black. Dry.	1	0.0		
1–4	SP		SAND, fine to medium, brown, trace silt and gravel. Slightly Moist. - wet	2	0.0	80	
4–5	SP		SAND, fine to medium, little silt. Very Moist.				
5–10			Push Geoprobe Tube 5 to 10. Pushed Shelby tube in new boring 5 to 10 feet. 18" recovery.				
10			End of boring at 10 feet.				

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LOG OF BORING WS-GT-3

Midwest Generation
Waukegan Station
Waukegan, IL

Project No. 15805

Date Completed : 08/08/05
Drilling Method : Direct-Push
Drilling Company : CABENO Env. Field Services
Operator : D. Joyce
Logged By : P. Allenstein

Depth in Feet	USCS	GRAPHIC	DESCRIPTION	PID Screening	PID (ppm)	% Recovery	Compressive Strength
0–1	GW		SAND and GRAVEL, dark brown. Dry.	1	0.0		
1–2	SP		Bottom Ash, black and gray, fine, some sand and gravel. Dry.				
2–3	CO		COAL, black, some gray clayey bottom ash. Moist.	2	0.0	80	
3–4	SP		SAND, fine to medium, black and brown, little silt. Moist.				
4–5			Push Geoprobe Tube 5 to 10. Full recovery.				
5–6							
6–7							
7–8							
8–9							
9–10							
10–11			End of boring at 10 feet.				
11–12							
12–13							
13–14							
14–15							
15–16							
16–17							
17–18							
18–19							
19–20							

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LOG OF BORING WS-GT-4

Midwest Generation
Waukegan Station
Waukegan, IL

Project No. 15805

Date Completed : 08/08/05
Drilling Method : Direct-Push
Drilling Company : CABENO Env. Field Services
Operator : D. Joyce
Logged By : P. Allenstein

Depth in Feet	USCS	GRAPHIC	DESCRIPTION	PID Screening	PID (ppm)	% Recovery	Compressive Strength
0–1	GW		SAND and GRAVEL, brown. Dry.	1	0.0		
1–3	GW		Bottom Ash and SAND and GRAVEL Mixture. Very Moist.	2	0.0	100	
3–10	GW		Bottom Ash, black, medium to coarse sand and gravel, some fines. Slightly Moist.	3	0.0		
				4	0.0	80	
			- wet, some organics				
10–13	SP		SAND, fine to medium, some silt and clay, brown, organics. Slightly Moist.	5	0.0		
13–19	SP		Bottom Ash, black, granular, medium to coarse sand and gravel. Slightly Moist.	6	0.0	70	
				7	0.0		
19–22	SP		SAND, gray, fine to medium, trace silt.	8	0.0		
22–27			Push Geoprobe Tube 22 to 27 feet. Full Recovery				
27–30			End of boring at 27 feet.				

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LOG OF BORING WS-GT-5

Midwest Generation
Waukegan Station
Waukegan, IL

Project No. 15805

Date Completed : 08/08/05
Drilling Method : Direct-Push
Drilling Company : CABENO Env. Field Services
Operator : D. Joyce
Logged By : P. Allenstein

Depth in Feet	USCS	GRAPHIC	DESCRIPTION	PID Screening	PID (ppm)	% Recovery	Compressive Strength
0–1	GW		SAND and GRAVEL, brown, grass. Dry.	1	0.0		
1–4	SM		Bottom Ash, light gray, fine sand and silt powder. Dry.	2	0.0	80	
			- 3" light brown SAND, fine to medium. Dry.	3	0.0		
4–9	SM		Bottom Ash, fine to medium sand and silt, brown some gray, some slag. Slightly Moist.	4	0.0	100	
9–22	SP		Bottom Ash, black, granular, medium to coarse sand and gravel. Slightly Moist.	5	0.0		
				6	0.0	60	
				7	0.0	80	
				8	0.0	100	
22–27			Push Geoprobe Tube 22 to 27 feet. 24" Recovery.				
27			End of boring at 27 feet.				

Electronic Filing: Received, Clerk's Office 10/31/2022

ATTACHMENT 3
Will County Station Geotechnical Study Results

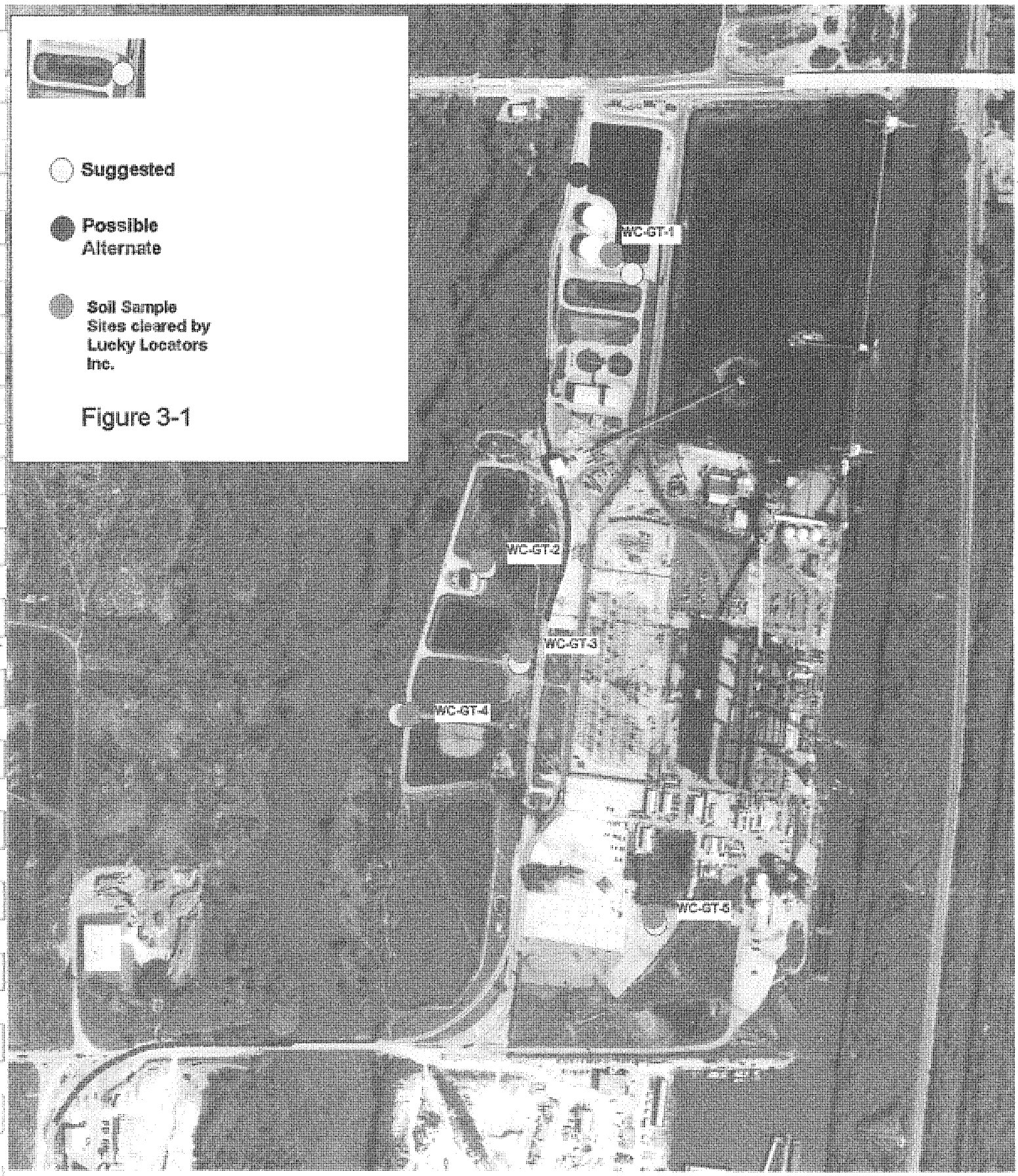
Suggested
Possible Alternate
Soil Sample Sites cleared by Lucky Locators Inc.
WC-GT-1
WC-GT-2
WC-GT-3
WC-GT-4
WC-GT-5

Figure 3-1

Electronic Filing: Received, Clerk's Office 10/31/2022

Table 3-1. Soil Sample Geotechnical Data - Midwest Generation, Will County Station, Romeoville, IL

Sample	Depth	Soil Description	Moisture (%)	Density (pcf)	Atterberg		Grain Size #40	Hydrometer (% passing #200)	Specific Gravity	Permeability Test (cm/s)
					LL (%)	PI (%)				
WC-GT-1	5 to 10'	Clayey Sand, dark brown to tan	3.4	118	31	15	25.1	11.4	2.66	1.35x10-1
WC-GT-2	5 to 10'	Sand with gravel, dark brown	18.1	92	NP	NP	35.1	11.9	2.65	4.02x10-3
WC-GT-3	3 to 8'	Lean Clay, dark brown	10.0	103	35	12	25.6	19.7	2.71	1.86x10-6***
WC-GT-4	5 to10'	Silty Clay, dark brown	9.5	128	25	7	35.4	23.3	2.7	3.65x10-7***
WC-GT-5	5-9'	Sandy Clay with Gravel	4.2	119	NP	NP	39	35	2.65	*

*Unable to perform permeability test, too much stone, not enough soil sample
**Remolded sample to obtain the dry density
***Verbal estimate provided by geotechnical lab. The data package in Attachment 7 indicates that due to the coarse fraction the samples could not be ideally remolded. The above verbal estimate is not a quantitaive number due to the remolding issue and is therefore not reported as such in Attachment 7.
NA - Not Analyzed
NP - Not Plastic

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LOG OF BORING WC-GT-1

Midwest Generation
Will County Station
Romeoville, IL

Project No. 15805

Date Completed : 08/09/05
Drilling Method : Direct-Push
Drilling Company : CABENO Env. Field Services
Operator : D. Joyce
Logged By : P. Allenstein

Depth in Feet	USCS	GRAPHIC	DESCRIPTION	PID Screening	PID (ppm)	% Recovery	Compressive Strength
0–1	GW		GRAVEL and SAND, light brown / gray, trace silt and clay. Dry.	1	0.0		
1–3	CL		CLAY, dark brown, some sand and gravel. Dry.	2	3.0	80	>4.5
3–5	GW		SLAG and Bottom Ash, black and dark gray, medium to coarse sand, little silt. Dry to Slightly Moist. - clayey weathered bedrock, gray, moist	3	25		

End of Boring at 5 feet.
Push geoprobe tube 0 to 5 feet in new boring.

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LOG OF BORING WC-GT-2

Midwest Generation
Will County Station
Romeoville, IL

Project No. 15805

Date Completed : 08/09/05
Drilling Method : Direct-Push
Drilling Company : CABENO Env. Field Services
Operator : D. Joyce
Logged By : P. Allenstein

Depth in Feet	USCS	GRAPHIC	DESCRIPTION	PID Screening	PID (ppm)	% Recovery	Compressive Strength
0–2	ML		Bottom Ash, brown and black, fine, little gravel. Dry. - increase gravel	1	0.0		
3–4	SP		SAND, fine to medium, dark brown to brown, little silt. Slightly Moist to Moist.	2	0.0	80	
5–6	SP			3	0.0		
7–9	SP		- very moist	4	0.0	80	
10			End of Boring at 10 feet.				
11			Push geoprobe tube 5 to 10 feet in new boring.				
12–20							

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LOG OF BORING WC-GT-3

Midwest Generation
Will County Station
Romeoville, IL

Project No. 15805

Date Completed : 08/09/05
Drilling Method : Direct-Push
Drilling Company : CABENO Env. Field Services
Operator : D. Joyce
Logged By : P. Allenstein

Depth in Feet	USCS	GRAPHIC	DESCRIPTION	PID Screening	PID (ppm)	% Recovery	Compressive Strength
0–1	SP		Bottom Ash and Coal, black, fine to medium, little gravel. Slightly Moist.	1	0.0		
2	GW		SAND-SILT-GRAVEL mixture, with crushed limestone, Slightly Moist.				
3–4	CL/GW		CLAY and GRAVEL, dark brown. Slightly Moist.	2	0.0	70	
5	CL/GW		- layer orange brown sand and gravel				
6–7	CL/GW			3	0.0		
8–9	GW		SLAG, black, fine to medium sand with fine gravel. Moist. - clayey weathered bedrock, gray	4	0.0	40	
10			End of Boring at 9.5 feet.				
11			Attempt push Shelby Tube, colapsed.				
12			Push geoprobe tube 3 to 8 feet in new boring. 28 " recovery.				
13–20							

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LOG OF BORING WC-GT-4

Midwest Generation
Will County Station
Romeoville, IL

Project No. 15805

Date Completed : 08/09/05
Drilling Method : Direct-Push
Drilling Company : CABENO Env. Field Services
Operator : D. Joyce
Logged By : P. Allenstein

Depth in Feet	USCS	GRAPHIC	DESCRIPTION	PID Screening	PID (ppm)	% Recovery	Compressive Strength
0–1	SP		Bottom Ash, sand and gravel. Dry. - black silt and fine sand, trace gravel. Dry. - gray	1	0.0		
2	CL/GW		CLAY and GRAVEL, some sand, dark brown. Dry.				
3–4	GW		SAND and GRAVEL, light brown. Dry.	2	0.0	100	
5–6			Pushed Geoprobe Tube 5 to 10. 41" recovery.	3	0.0		
7–9				4	0.0	70	
10			End of Boring at 10 feet.				
11–20							

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LOG OF BORING WC-GT-5

Midwest Generation
Will County Station
Romeoville, IL

Project No. 15805

Date Completed : 08/09/05
Drilling Method : Direct-Push
Drilling Company : CABENO Env. Field Services
Operator : D. Joyce
Logged By : P. Allenstein

Depth in Feet	USCS	GRAPHIC	DESCRIPTION	PID Screening	PID (ppm)	% Recovery	Compressive Strength
0–1	GW		SAND-SILT-GRAVEL Mixture, brown, black, white, orange/brown. Dry to Slightly Moist.	1	0.0		
2	WBR		Weathered Bedrock, limestone. Moist.	2	0.0	100	

End of Boring at 2.5 feet.

Repeated boring for sample volume. Bagged.

ATTACHMENT 4
Joliet Station #29 Geotechnical Study Results

Suggested
Possible Alternate
Soil Sample Sites cleared by Lucky Locators Inc.
J829-GT4
J829-GT3
J829-GT2
J829-GT5
J829-GT1
J829-GT6

Figure 4-1

Electronic Filing: Received, Clerk's Office 10/31/2022

Table 4-1. Soil Sample Geotechnical Data - Midwest Generation, Joilet Station #29, Joliet, IL

Sample	Depth	Soil Description	Moisture (%)	Density (pcf)	Atterberg		Grain Size #40	Hydrometer (% passing #200)	Specific Gravity	Permeability Test (cm/s)
					LL (%)	PI (%)				
JS-29-GT-1	19-24'	Sand, fine grained, trace clay and gravel, dark yellow	5.3	120	NP	NP	13.9	8.7	2.62	2.96x10-2
JS-29-GT-2	19-24	Gravelly sand, brown	10.0	87.0	NP	NP	21	14	2.66	*
		Gravelly sand, trace clay, dark brown	6.0							
JS-29-GT-3	19-24	Sand, with gravel, trace clay, brown	8.6	121**	NP	NP	13	9	2.64	2.51x10-2
		Lean clay, gray	7.3							
JS-29-GT-4	17-22	Limestone with fine to coarse sand	4.1	124.0	NP	NP	11	7	2.7	*
JS29-GT-5	5-14'	Clayey gravel with sand, dark gray	26.0	94.0	34	11	32	18.7	2.56	4.7x10-4
JS-29-GT-6	11-14'	Organic clay, dark gray, black	74.6	53.0	78	17	88.9	65.4	2.41	NA

*Unable to perform permeability test, too much stone, not enough soil sample
**Remolded sample to obtain the dry density
NA - Not Analyzed
NP - Not Plastic

Electronic Filing: Received, Clerk's Office 10/31/2022

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LOG OF BORING JS29-GT-1

Midwest Generation
Joliet Station #29
Joliet, IL

Project No. 15805

Date Completed : 08/10/05
Drilling Method : Direct-Push
Drilling Company : CABENO Env. Field Services
Operator : D. Joyce
Logged By : P. Allenstein

Depth in Feet	USCS	GRAPHIC	DESCRIPTION	PID Screening	PID (ppm)	% Recovery	Compressive Strength
0–1	GW		Bottom Ash and GRAVEL, dark gray. Dry.	1	0.0		
1–2	GW		Crushed Limestone, gravel and sand, clayey at 1.5 to 2 feet. Slightly Moist.	2	0.0	80	
2–3	GW		SAND and GRAVEL, orange brown, little silt, very stiff. Dry to Slightly Moist.	3	0.0		
3–4	GW						
4–5	GW			4	0.0	70	
5–6	GW						
6–7	GW			5	0.0		
7–8	GW						
8–9	GW			6	0.0	60	
9–10	GW						
10–11	GW						
11–12	GW						
12–13	GW						
13–14	GW		- 10 "clayey	7	0.0		
14–15	GW						
15–16	GW						
16–17	GW			8	0.0	50	
17–18	GW						
18–19	GW			9	0.0		
19–20	GW		Push Geoprobe Tube 19 to 24. 33" recovery.				
20–21	GW						
21–22	GW						
22–23	GW						
23–24	GW						
24–25			End of Boring at 24 feet.				
25–26							
26–27							
27–28							
28–29							
29–30							

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LOG OF BORING JS29-GT-2

Midwest Generation
Joliet Station #29
Joliet, IL

Project No. 15805

Date Completed : 08/10/05
Drilling Method : Direct-Push
Drilling Company : CABENO Env. Field Services
Operator : D. Joyce
Logged By : P. Allenstein

Depth in Feet	USCS	GRAPHIC	DESCRIPTION	PID Screening	PID (ppm)	% Recovery	Compressive Strength
0–1	SM		SAND and SILT, fine to medium, dark brown, some slag. Dry.	1	0.0		
1–2	GW		Crushed Limestone, sand and gravel. Dry.				
2–5	GW/CL		CLAY and GRAVEL, dark brown, black, some sand and silt. Slightly Moist.	2	0.0	60	
5–6	GW/CL		- 6" clayey, black, soft				
6–9	GW/CL		- 6" coarse gravel and cobbles	3 4	0.0 0.0	40	
10–15	CL		SILT and CLAY, black, some sand and gravel, soft, organic odor. Moist. - some limestone gravel	5 6	0.0 0.0	40	1.0 1.0
15–22			Push Geoprobe Tube 15 to 19. 19" recovery. Push Geoprobe Tube 19 to 22. 22" recovery.				
22			End of Boring at 22 feet.				

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LOG OF BORING JS29-GT-3

Midwest Generation
Joliet Station #29
Joliet, IL

Project No. 15805

Date Completed : 08/10/05
Drilling Method : Direct-Push
Drilling Company : CABENO Env. Field Services
Operator : D. Joyce
Logged By : P. Allenstein

Depth in Feet	USCS	GRAPHIC	DESCRIPTION	PID Screening	PID (ppm)	% Recovery	Compressive Strength
0–2	CL		Bottom Ash, dark brown, clay, little gravel. Dry.	1	0.0		
	GW		Crushed Limestone, sand and gravel. Dry.				
3–4	CL		CLAY, dark brown, brown, some sand and silt, trace gravel. Slightly Moist.	2	0.0	100	4.0 - >4.5
5–6			- mostly brown, slightly moist	3	0.0	100	4.0 - >4.5
7–8			- 1" black layer	4	0.0		4.0 - >4.5
9–11			- trace gray silt	5	0.0	100	4.0 - >4.5
12–14			- softer	6	0.0		1.0 - 1.5
15	CL		CLAY, brown, little to trace sand and silt, trace gravel. Slightly Moist.				
16	CL		CLAY, brown, with gray silt, some dark. Moist.				
17–18	CL		CLAY, dark brown, some silt, sand and gravel. Moist.	7	0.0	100	1.0 - 4.0
			- vug of dark gray fine sand, wet.				
19–24			Push Geoprobe Tube 19 to 24. 30" recovery.				
25			End of Boring at 24 feet.				

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LOG OF BORING JS29-GT-4

Midwest Generation
Joliet Station #29
Joliet, IL

Project No. 15805

Date Completed : 08/10/05
Drilling Method : Direct-Push
Drilling Company : CABENO Env. Field Services
Operator : D. Joyce
Logged By : P. Allenstein

Depth in Feet	USCS	GRAPHIC	DESCRIPTION	PID Screening	PID (ppm)	% Recovery	Compressive Strength
0–5	CL/GP		GRAVEL CLAY and GRAVEL, coarse, dark brown, some sand and silt, stiff. Dry. - some brown and orange brown	1 2	0.0 0.0	60	
5–6	CL		SILT and CLAY, dark brown and black, close to peat. Moist.	3	0.0		1.5
6–17	GW		SAND and GRAVEL, orange brown, some coarse gravel, trace silt. Dry.	4 5 6 7 8	0.0 0.0 0.0 0.0 0.0	60 50 50	
17–22			Push Geoprobe Tube 17 to 22. 33" recovery.				
22			End of Boring at 22 feet.				

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LOG OF BORING JS29-GT-5

Midwest Generation
Joliet Station #29
Joliet, IL

Project No. 15805

Date Completed : 08/10/05
Drilling Method : Direct-Push
Drilling Company : CABENO Env. Field Services
Operator : D. Joyce
Logged By : P. Allenstein

Depth in Feet	USCS	GRAPHIC	DESCRIPTION	PID Screening	PID (ppm)	% Recovery	Compressive Strength
0-1	TS		Top Soil, black, clayey, some gravel. Slightly Moist. GRAVEL, brown, some sand and silt. Dry.	1	0.0		
2-4	CL		CLAY, dark brown and black, some silt, little sand and gravel, moderately soft. Slightly Moist. - cobble	2	0.0	80	1.5 - 2.0
5-6				3	0.0	75	
7-9			- cobble	4	0.0		
10-11				5	0.0	50	
12-13			- wet gravel	6	0.0		
14			End of Boring at 14 feet.				
15			Attempted Shelby Tube, colapsed then refusal.				
16-17			Retained Geoprobe Tube 5 to 9. 34" recovery. Retained Geoprobe Tube 9 to 14. 22" recovery.				
18-30							

Electronic Filing: Received, Clerk's Office 10/31/2022

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KPRG and Associates, Inc.

LOG OF BORING JS29-GT-6

Midwest Generation
Joliet Station #29
Joliet, IL

Project No. 15805

Date Completed : 08/10/05
Drilling Method : Direct-Push
Drilling Company : CABENO Env. Field Services
Operator : D. Joyce
Logged By : P. Allenstein

Depth in Feet	USCS	GRAPHIC	DESCRIPTION	PID Screening	PID (ppm)	% Recovery	Compressive Strength
0-2	ML / GW / CL		Bottom Ash, silt, black, some gravel. Dry. Crushed Limestone, sand and gravel. Dry. CLAY, black, some sand and gravel and bottom ash. Dry.	1	0.0		
2-6	GW		SAND and GRAVEL, orange brown, some silt and clay. Dry.	2	0.0	70	
				3	0.0		
6-9	CL		CLAY, black, with sand and gravel. Slightly Moist. - orange brown, dry	4	0.0	70	
9-10	CG		GRAVEL, black, some silt and clay. Wet.	5	0.0		
10-15	PT		PEAT, blalck, soft. Slightly Moist to Moist. - wet - weathered bedrock	6	0.0	100	1.0 - 1.5

End of Boring at 15 feet.

Bagged 11 to 14 feet. Also from new hole 11 to 14 feet.

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ATTACHMENT 5
Joliet Station #9 Geotechnical Study Results

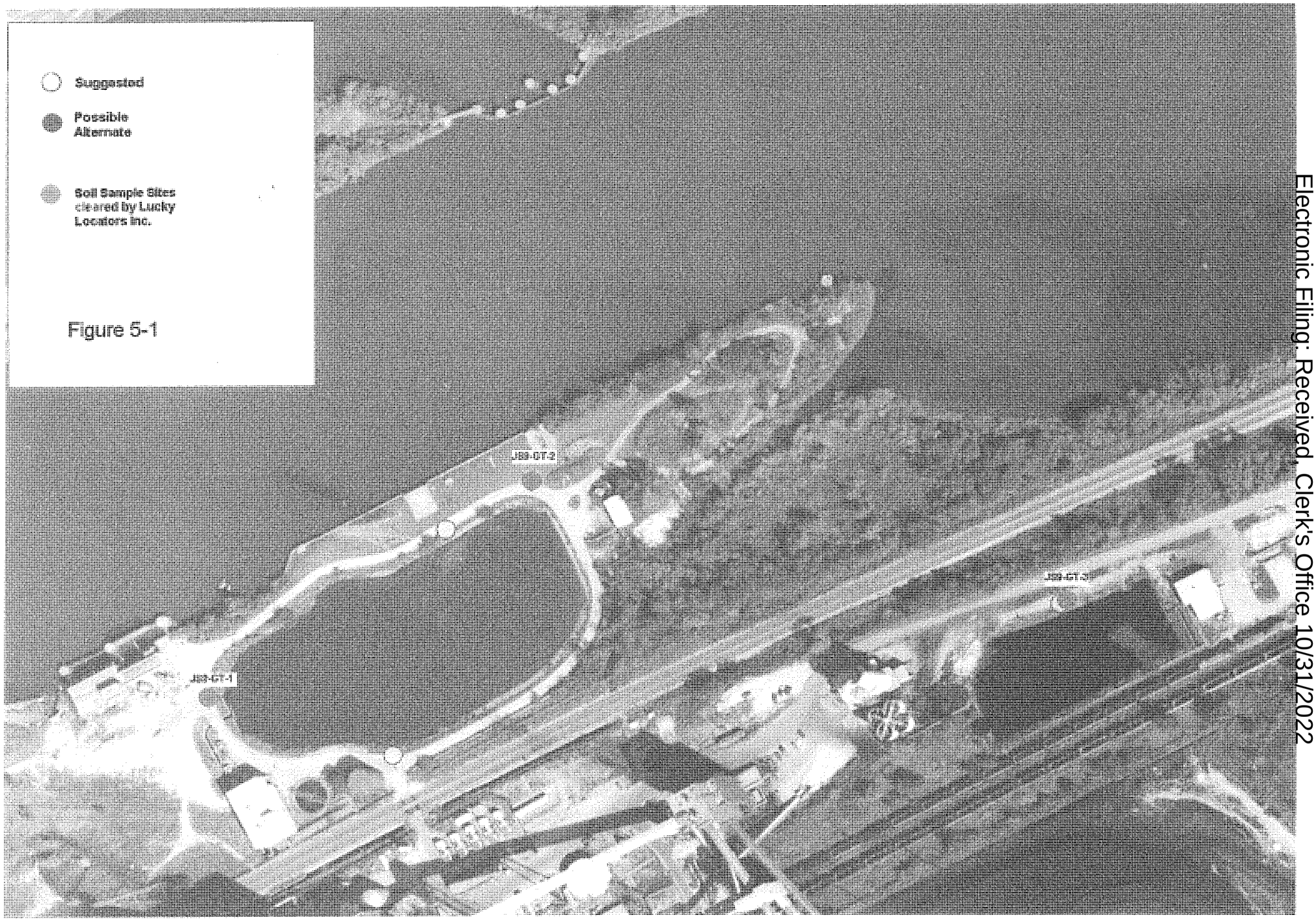

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Table 5-1. Soil Sample Geotechnical Data - Midwest Generation, Joliet Station #9, Joliet, IL

Sample	Depth	Soil Description	Moisture (%)	Density (pcf)	Atterberg		Grain Size #40	Hydrometer (% passing #200)	Specific Gravity	Permeability Test (cm/s)
					LL (%)	PI (%)				
JS-9-GT-1	7-12'	Sand, with gravel, gray	4	110	16	NP	32	23	2.63	*
		Organic clay, with gravel	20.0							
JS-9-GT-2	7-11.5'	Clayey sand, with organics, trace gravel, dark brown	23.7	91.0	NP	NP	51	21		2.73x10-2
		Organic clay, occasional shells and peat, trace gravel, black, dark brown	56.3							
JS-9-GT-3	8-13'	Sand, with gravel, gray	5.5	86	NP	NP	11	7	2.66	*

*Unable to perform permeability test, too much stone, not enough soil sample
**Remolded sample to obtain the dry density
NA - Not Analyzed
NP - Not Plastic

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LOG OF BORING JS9-GT-1

Midwest Generation
Joliet Station #29
Joliet, IL

Project No. 15805

Date Completed : 08/10/05
Drilling Method : Direct-Push
Drilling Company : CABENO Env. Field Services
Operator : D. Joyce
Logged By : P. Allenstein

Depth in Feet	USCS	GRAPHIC	DESCRIPTION	PID Screening	PID (ppm)	% Recovery	Compressive Strength
0–1	GW		Crushed Limestone and SILT, gray and black. Dry.	1	0.0		
1–2	CL		CLAY, dark brown, with gravel, little silt and fine to medium sand. Slightly Moist.	2	0.0	100	
2–3	CL		- 3" crushed limestone gravel				
3–4	CL			3	0.0		
4–5	CL		- 3" crushed limestone gravel				
5–6	GW		SAND-SILT-GRAVEL Mixture, black, moderately stiff. Moist.	4	0.0	60	
6–7	GW		- gravel				
7–8	SM		SILT and fine SAND, black, some clay. little gravel. Moist.				
8–9	SM			5	0.0		
9–10	SM		- 3" gravel				
10–11			End of Boring at 10 feet.				
11–12			Push Geoprobe Tube in new boring 7 to 12 feet. 26" Recovery.				
12–13							
13–14							
14–15							
15–16							
16–17							
17–18							
18–19							
19–20							

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LOG OF BORING JS9-GT-2

Midwest Generation
Joliet Station #29
Joliet, IL

Project No. 15805

Date Completed : 08/10/05
Drilling Method : Direct-Push
Drilling Company : CABENO Env. Field Services
Operator : D. Joyce
Logged By : P. Allenstein

Depth in Feet	USCS	GRAPHIC	DESCRIPTION	PID Screening	PID (ppm)	% Recovery	Compressive Strength
0–1	ML		SILT, gray, with fine sand and gravel. Moist.	1	0.0		
1–2	CL/GW		CLAY and GRAVEL, dark brown, some silt and fine to medium sand. Moist.	2	0.0	90	
2–5	SM		SAND-SILT-CLAY Mixture, black, little gravel. Moist.	3	0.0		
5–7	SM		SAND-SILT-CLAY Mixture, black, little gravel. Moist.	4	0.0	30	
7–10	PT		PEAT, black/dark brown, trace shells. Moist.	5	0.0		<1.0

End of Boring at 10 feet.

Push Geoprobe Tube in new boring 7 to 11.5 feet.
Refusal. 35" Recovery.

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LOG OF BORING JS9-GT-3

Midwest Generation
Joliet Station #29
Joliet, IL

Project No. 15805

Date Completed : 08/10/05
Drilling Method : Direct-Push
Drilling Company : CABENO Env. Field Services
Operator : D. Joyce
Logged By : P. Allenstein

Depth in Feet	USCS	GRAPHIC	DESCRIPTION	PID Screening	PID (ppm)	% Recovery	Compressive Strength
0–1	SM		SILT and fine SAND, organics, black. Moist.	1	0.0		
1–2	SM		SAND-SILT-CLAY Mixture, black, trace coarse gravel. Slightly Moist.	2	0.0	50	
2–4	GW		Crushed Limestone GRAVEL. Slightly Moist.	3	0.0		
4–6	SM		SLAG, black, granular, sand and gravel. Slightly Moist.	4	0.0		
6–8	GW		SAND and GRAVEL, red, little clay and silt. Very Moist.	5	0.0	30	
8–15	GW		Crushed Limestone GRAVEL, tan, with gray and black fine sand and silt. Very Moist.	6	0.0		
				7	0.0	30	

End of Boring at 15 feet.

Push Geoprobe Tube in new boring 8 to 13 feet. 18" Recovery.

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ATTACHMENT 6
Powerton Station Geotechnical Study Results

Suggested
Possible Alternate
Soil sample sites, cleared by Lucky Locators Inc.
PS-GT-1
PS-GT-2
PS-GT-3
PS-GT-4
PS-GT-5
PS-GT-6
PS-GT-7
PS-GT-8
PS-GT-9

Figure 6-1

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Table 6-1. Soil Sample Geotechnical Data - Midwest Generation, Powerton Station, Pekin, IL

Sample	Depth	Soil Description	Moisture (%)	Density (pcf)	Atterberg		Grain Size #40	Hydrometer (% passing #200)	Specific Gravity	Permeability Test (cm/s)
					LL (%)	PI (%)				
PS-GT-1	10'-12'	Clayey Sand/Sandy Clay, with gravel, dark brown	7.8	115	NP	NP	83	17	2.7	6.2x10-5
			9.7		22	NP	79	48	2.56	
PS-GT-2	7-8.5	Sand, trace clay and gravel, medium to coarse grained, brown	9.5	126.7	22	NP	79	48	2.7	1.1x10-4
PS-GT-3	7'-9'	Topsoil, with gravel, dark brown (possible cave-in)	12.9	112					2.7	
		Sandy Lean Clay, trace gravel and organics, dark brown	28.0	110	31	15	58	17	2.68	2x10-4
PS-GT-4	10'-11.5'	Sand, with clay and gravel, trace organics fine to coarse grained, dark brown	7.9	116	NP	NP	33	16	2.77	1.6x10-7
PS-GT-5	17-19	Clayey Sand, with gravel, dark brown	16.0							
		Lean Clay, trace sand	38.5	93	53	27	63	44	2.44	NA
PS-GT-6	1'	Fill: Sand, fine to medium coarse, trace gravel, dark brown	4.9	113.5	NP	NP	33	5	2.52	8.37x10-3
PS-GT-7	10-13'	Sand, with silt and gravel, dark brown, black	7.6	118.0	21	3	44	17	2.63	2.2x10-3
PS-GT-8	10-15'	Fill: cinders, metal shavings, glass, black	9.0	86**	NP	NP	14	4		
		Silty sand, trace clay, dark gray	12.0	115.0	NP	NP	34	14	2.61	2.31x10-2
PS-GT-9	15-20'	Fill: Sand, trace clay and gravel, dark brown	7.9	113.0	NP	NP	30	21	2.64	1.7x10-3
		Clayey sand, with gravel, brown and gray	9.8							

*Unable to perform permeability test, too much stone, not enough soil sample
**Remolded sample to obtain the dry density
NA - Not Analyzed
NP - Not Plastic

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LOG OF BORING PS-GT-1

Midwest Generation
Powerton Station
Pekin, IL

Project No. 15805

Date Completed : 08/11/05
Drilling Method : Direct-Push
Drilling Company : CABENO Env. Field Services
Operator : D. Joyce
Logged By : P. Allenstein

Depth in Feet	USCS	GRAPHIC	DESCRIPTION	PID Screening	PID (ppm)	% Recovery	Compressive Strength
0–2	SC		CLAY top soil, brown, with sand-silt-gravel mixture, organics. Slightly Moist to Dry. - less clay	1	0.0		
3–4	CL		CLAY, brown, some silt, little sand, trace gravel. Slightly Moist.	2	0.0	90	4.0 to >4.5
5–6				3	0.0		2.0 to 2.5
6–9			- darker (dark brown) - increase gravel	4	0.0	60	
10–12			Push Shelby Tube 10-12. 19 " recovery.				
12			End of Boring at 18 feet.				

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LOG OF BORING PS-GT-2

Midwest Generation
Powerton Station
Pekin, IL

Project No. 15805

Date Completed : 08/11/05
Drilling Method : Direct-Push
Drilling Company : CABENO Env. Field Services
Operator : D. Joyce
Logged By : P. Allenstein

Depth in Feet	USCS	GRAPHIC	DESCRIPTION	PID Screening	PID (ppm)	% Recovery	Compressive Strength
0–1	SC		CLAY top soil, brown and light brown, organics. Dry.				
1–5	CL		CLAY, brown, some silt and fine sand, trace gravel. Dry.	1 2	0.0 0.0	70	>4.5
5–11	SP		SAND, fine, brown and orange brown, some silt. Slightly Moist to Dry. - dark brown - some clayey layers	3 4	0.0 0.0	100 100	
11–12	CL		CLAY, gray, little medium sand and fine gravel, soft. Moist. (Native)	5	0.0		1.0

End of Boring at 12 feet.

Push Shelby Tube in new boring 7 to 8.5 feet. 27" recovery.

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LOG OF BORING PS-GT-3

Midwest Generation
Powerton Station
Pekin, IL

Project No. 15805

Date Completed : 08/11/05
Drilling Method : Direct-Push
Drilling Company : CABENO Env. Field Services
Operator : D. Joyce
Logged By : P. Allenstein

Depth in Feet	USCS	GRAPHIC	DESCRIPTION	PID Screening	PID (ppm)	% Recovery	Compressive Strength
0–1	GW		Bottom Ash, black, fine, and GRAVEL, fine to medium, limestone. Dry.	1	0.0		
1–2	CL		CLAY, dark brown, some silt and fine sand, trace gravel. Dry.	2	0.0	100	>4.5
2–5	GW		SAND and GRAVEL, brown and orange brown, some clay in layers. Slightly Moist.	3	0.0		
5–7	CL		CLAY, brown and dark brown, some fine sand and silt, trace gravel, Moist. - fine sand and silt seam, brwon	4	0.0		1.0
				5	0.0	100	4.0
7–9			Push Shelby Tube 7 to 9 feet. 21.5" recovery.				

End of Boring at 9 feet.

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(DRAFT) LOG OF BORING PS-GT-4

Midwest Generation
Powerton Station
Pekin, IL

Project No. 15805

Date Completed : 08/11/05
Drilling Method : Direct-Push
Drilling Company : CABENO Env. Field Services
Operator : D. Joyce
Logged By : P. Allenstein

Depth in Feet	USCS	GRAPHIC	DESCRIPTION	PID Screening	PID (ppm)	% Recovery	Compressive Strength
0–1	GW		GRAVEL and SILT, gray and black. Dry.	1	0.0		
1–3	GW		CLAY-SAND-GRAVEL Mixture, brown some dark brown and black. Slightly Moist.	2	0.0	100	
4–7	SM		SAND and SILT, brown, fine, little gravel. Slightly Moist. - gray and light brown	3	0.0		
8–9	CL		CLAY, dark gray to black, little medium sand, trace gravel. Slightly Moist to Moist.	4	0.0	90	1.0
9–10	CL		CLAY, dark gray to black, little medium sand, trace gravel. Slightly Moist to Moist.	5	0.0		4.0
10–11			Push Shelby Tube 10-11.5. Refusal. 21.5" recovery.				
12			End of Boring at 11.5 feet.				

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KPRG and Associates, Inc.

LOG OF BORING PS-GT-5

Midwest Generation
Powerton Station
Pekin, IL

Project No. 15805

Date Completed : 08/11/05
Drilling Method : Direct-Push
Drilling Company : CABENO Env. Field Services
Operator : D. Joyce
Logged By : P. Allenstein

Depth in Feet	USCS	GRAPHIC	DESCRIPTION	PID Screening	PID (ppm)	% Recovery	Compressive Strength
0–2	GW		Top Soil, clayey, brown, some sand and gravel. Dry.	1	0.0		
2–4	SM		Bottom Ash, brown, sand and silt. Dry.	2	0.0	80	
4			- grade to dark brown and black				
4–15	CL		CLAY and SILT, brown and gray, some slag, medium to coarse sand and fine gravel. Moist.	3	0.0		
5–6				4	0.0	80	
8–9				5	0.0		
12–13			12-14 - granular, little fines	6	0.0	80	
15–16	CL		PEAT, brown, moderately soft. Moist.	7	0.0	50	
17–19			Push Shelby Tube 17-19. 22" recovery.				
19			End of Boring at 19 feet.				

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LOG OF BORING PS-GT-6

Midwest Generation
Powerton Station
Pekin, IL

Project No. 15805

Date Completed : 08/11/05
Drilling Method : Direct-Push
Drilling Company : CABENO Env. Field Services
Operator : D. Joyce
Logged By : P. Allenstein

Depth in Feet	USCS	GRAPHIC	DESCRIPTION	PID Screening	PID (ppm)	% Recovery	Compressive Strength
0–1	SC		CLAY, brown, and Bottom Ash, brown, and Slag, sand, stiff. Dry.	1	0.0		
1–6	GW		SLAG and Bottom Ash, black, fine to medium sand and silt. Dry. - mixed with orange/brown clay and gravel.	2	0.0	100	
				3	0.0		
6–8	CL		CLAY, dark brown and black, some silt, trace gravel. Moist.	4	0.0	90	4.0
8–13	CL		CLAY-SAND-GRAVEL Mixture, brown. Slightly Moist. - 3" light brown silt and fine sand seam - darker	5	0.0		1.0
				6	0.0		
13–18			Attempt to Push Shelby Tube 13-15. Refusal. Push geoprobe tube 13-18. 40 " recovery.				
18–20			End of Boring at 18 feet.				

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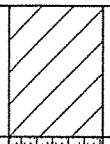
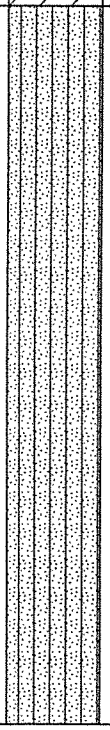
LOG OF BORING PS-GT-7

Midwest Generation
Powerton Station
Pekin, IL

Project No. 15805

Date Completed : 08/11/05
Drilling Method : Direct-Push
Drilling Company : CABENO Env. Field Services
Operator : D. Joyce
Logged By : P. Allenstein

Depth in Feet	USCS	GRAPHIC	DESCRIPTION	PID Screening	PID (ppm)	% Recovery	Compressive Strength
0–2	CL		CLAY and SILT, organics, light brown, some sand and gravel . Dry. - transistion (mixed layer)	1	0.0		
2–5	SM		SLAG and Bottom Ash, black and dark brown, some medium to coarse sand and silt. Dry.	2	0.0	100	
5–8				3	0.0		
8–11			- clayey, brown, very stiff	4	0.0	100	
11–13				5	0.0	100	

End of Boring at 13 feet. Refusal.

Push geoprobe tube in seperate boring 8 to 13.

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LOG OF BORING PS-GT-8

Midwest Generation
Powerton Station
Pekin, IL

Project No. 15805

Date Completed : 08/11/05
Drilling Method : Direct-Push
Drilling Company : CABENO Env. Field Services
Operator : D. Joyce
Logged By : P. Allenstein

Depth in Feet	USCS	GRAPHIC	DESCRIPTION	PID Screening	PID (ppm)	% Recovery	Compressive Strength
0–2	SP		SAND, fine to medium, brown and dark brown, little silt, trace gravel, very stiff. Dry.	1	0.0		
3–4	SM		SLAG and Bottom Ash, black and dark gray, fine to medium sand, some silt and clay, very stiff. Dry.	2	0.0	100	
5–6	SM		- clayey, brown	3	0.0		
7–9	SM		- granular, medium to coarse sand	4	0.0	100	
10–14	SM		- a few clayey layers, slightly moist	5	0.0	100	
15–20			Push geoprobe tube 15 to 20 feet. 44" recovery.				

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LOG OF BORING PS-GT-9

Midwest Generation
Powerton Station
Pekin, IL

Project No. 15805

Date Completed : 08/11/05
Drilling Method : Direct-Push
Drilling Company : CABENO Env. Field Services
Operator : D. Joyce
Logged By : P. Allenstein

Depth in Feet	USCS	GRAPHIC	DESCRIPTION	PID Screening	PID (ppm)	% Recovery	Compressive Strength
0–3	GW		Crushed Limestone, silt, sand and gravel. Dry.	1	0.0		
1–3	GW		CLAY and GRAVEL, brown, stiff. Dry.				
3–14	SM		SLAG and Bottom Ash, black and dark gray, medium to coarse sand, little silt. Dry to Slightly Moist.	2	0.0	100	
5–14	SM		- 6" gray clay with medium to coarse sand	3	0.0		>4.5
8–14	SM			4	0.0	100	>4.5
12–14	SM			5	0.0	100	
14–15	CL		CLAY, gray, trace silt, black ribbon. Moist.	6	0.0		1.5
15–20			Could not anchor to attempt Shelby Tube. Push geoprobe tube 15 to 20 feet. 44" recovery.				

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ATTACHMENT 7
Geotechnical Laboratory Report

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KPRG Project No. 15805 Laboratory Results
Terracon Project No. 58055075
October 11, 2005

Sample	Depth	Soil Description	Moisture (%)	Dry Density (pcf)	Atterberg		Grain Size #40	Hydrometer (% passing #200)	Specific Gravity	Coefficient of Permeability (cm/s)
					LL (%)	PI (%)				
CS-GT-1	5-10'	Sand, fine to coarse, trace gravel and silt, brown, dark brown, black	10.4	117**	NP	NP	24	12	2.71	2.2x10-3
CS-GT-2	10'-12'	Sand, fine to coarse grained, gray (crushed limestone) (top)	1.7		NP	NP	24	14	2.68	*
CS-GT-2	10'-12'	Lean Clay, trace sand, gray (bottom)	15.9	117	36	18	94	88		N/A
		(2nd test)	16.2		36	19				
CS-GT-4	5'-7'	Sand, with gravel, fine to medium, gray (crushed concrete)	2.2		NP	NP			2.65	*
CS-GT-4	5'-7'	Lean Clay, trace sand and gravel, gray	22.2	110	38	19	72	65	2.69	N/A
CS-GT-5	5'-7.5'	Sand, with gravel and clay, dark brown (possible cave-in)	7.3		NP	NP			2.5	
		Lean Clay, with sand, brown and gray	22.0	112	27	19	37	33	2.7	2.3x10-8
CS-GT-6	10-12.5'	Sandy Lean Clay, with gravel, brown and dark brown	6.3	118**	31	13	77	62	2.58	N/A
WS-GT-1	5 to 10'	Sand with trace gravel	5.6	114	NP	NP	94	1	2.63	1.05x10-2
WS-GT-2	7.5'-10'	Silty Sand, trace gravel, dark brown	15.2	107	NP	NP	79	18	2.44	1.52x10-2
			18.1							
WS-GT-3	5 to 10'	Sand with trace gravel	11.2	99	NP	NP	86	0	2.65	2.3x10-2
WS-GT-4	22-27'	Sand with trace gravel	5.4	114	NP	NP	53	2	2.64	2.16x10-2
WS-GT-5	22-27'	Sand, trace gravel, black	4.4	96	NP	NP	15	0	2.73	1.21x10-2
		(Bottom Ash?)								
WC-GT-1	5 to 10'	Clayey Sand, dark brown to tan	3.4	118	NP	NP	26	17	2.66	1.35x10-1
WC-GT-2	5 to 10'	Sand with gravel, dark brown	18.1	92	NP	NP	35	12	2.65	4.02x10-3
WC-GT-3	3 to 8'	Lean Clay, dark brown	10.0	103	35	12	26	20	2.71	***
WC-GT-4	5 to10' (btm)	Silty Clay, dark brown	9.5	128	25	7			2.7	***
WC-GT-4	5 to 10'	Sandy Gravel, with clay					35	23		
WC-GT-5	5-9'	Sandy Clay with Gravel	4.2	119	NP	NP	39	35	2.65	*

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KPRG Project No. 15805 Laboratory Results
Terracon Project No. 58055075
October 11, 2005

Sample	Depth	Soil Description	Moisture (%)	Dry Density (pcf)	Atterberg		Grain Size #40	Hydrometer (% passing #200)	Specific Gravity	Coefficient of Permeability (cm/s)
					LL (%)	PI (%)				
PS-GT-1	10'-12'	Clayey Sand, with gravel, dark brown	7.8	115	NP	NP	83	34	2.7	6.2x10-5
PS-GT-1	10'-12'	Sandy Clay, with gravel, dark brown	9.7		22	NP	79	48	2.56	
PS-GT-2	7-8.5	Clayey Sand, trace gravel, medium to coarse grained, brown	9.5	126.7	22	NP	79	48	2.7	1.1x10-4
PS-GT-3	7'-9'	Topsoil, with gravel, dark brown (possible cave-in)	12.9	112					2.7	
PS-GT-3	7'-9'	Sand, trace clay, gravel and organics, dark brown	28.0	110	31	15	58	17	2.68	2x10-4
PS-GT-4	10'-11.5'	Sand, with clay and gravel, trace organics fine to coarse grained, dark brown	7.9	116	NP	NP	33	16	2.77	1.6x10-7
PS-GT-5	17-19	Clayey Sand, with gravel, dark brown	16.0							
PS-GT-5	17-19	Sandy Lean Clay, trace gravel, brown	38.5	93	53	27	63	44	2.44	N/A
PS-GT-6	15-20'	Fill: Sand, fine to medium coarse, trace gravel, dark brown	4.9	113.5	NP	NP	33	5	2.52	8.37x10-3
PS-GT-7	10-13'	Sand, with silt and gravel, dark brown, black	7.6	118.0	21	3	44	17	2.63	2.2x10-3
PS-GT-8	10-15'	Fill: cinders, metal shavings, glass, black	9.0	86**	NP	NP	14	4		
PS-GT-8	10-15'	Silty sand, trace clay, dark gray	12.0	115.0	NP	NP	34	14	2.61	2.31x10-2
PS-GT-9	15-20' (top)	Silty Sand, dark gray	9.8		22	3	30	14		
PS-GT-9	15-20' (mid)	Gravel, with silt and sand, dark brown					12	7		
PS-GT-9	15-20' (btm)	Sand, trace clay and gravel, dark brown	7.9	113.0	24	3	30	21	2.64	1.7x10-3

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KPRG Project No. 15805 Laboratory Results
Terracon Project No. 58055075
October 11, 2005

Sample	Depth	Soil Description	Moisture (%)	Dry Density (pcf)	Atterberg		Grain Size #40	Hydrometer (% passing #200)	Specific Gravity	Coefficient of Permeability (cm/s)
					LL (%)	PI (%)				
JS-9-GT-1	7-12'	Sand, with gravel, gray	4	110	16	NP	32	23	2.63	*
JS-9-GT-1	7-12'	Organic Clay, with gravel	20.0							
JS-9-GT-2	7-11.5'	Clayey Sand, with organics, trace gravel, dark brown	23.7	91.0	NP	NP	51	21		2.73x10-2
JS-9-GT-2	7-11.5'	Organic Clay, occasional shells and peat, trace gravel, black, dark brown	56.3							
JS-9-GT-3	8-13'	Sand, with gravel, gray	5.5	86	NP	NP	11	7	2.66	*
JS-29-GT-1	19-24'	Sandy Gravel, trace clay, dark yellow	5.3	120	16	NP	14	9	2.62	2.96x10-2
JS-29-GT-2	19-24	Gravelly Sand, brown	10.0	87.0	NP	NP	21	14	2.66	*
JS-29-GT-2	19-24	Gravelly Sand, trace clay, dark brown	6.0		NP	NP				
JS-29-GT-3	19-24	Poorly graded gravel with clay and sand, brown	8.6	121**	NP	NP	13	9	2.64	2.51x10-2
JS-29-GT-3	19-24	Lean clay, gray	7.3							
JS-29-GT-4	17-22	Limestone with fine to coarse sand	4.1	124.0	NP	NP	11	7	2.7	*
JS29-GT-5	5-9'	Clayey Gravel with sand, dark gray	26.0	94.0	34	11	32	19	2.56	4.7x10-4
	9-14' (top)	Gravel, with silt and sand, dark gray			NP	NP	16	10		
	9-14' (btm)	Silty Gravel			21	NP	23	16		
JS-29-GT-6	11-14'	Organic Silt, dark gray, black	74.6	53.0	78	17	89	65	2.41	N/A

*Unable to perform permeability test, too much stone, not enough soil sample
**Remolded sample to obtain the dry density
***Unable to properly remold sample, too much large aggregate
NP=Non Plastic Soil

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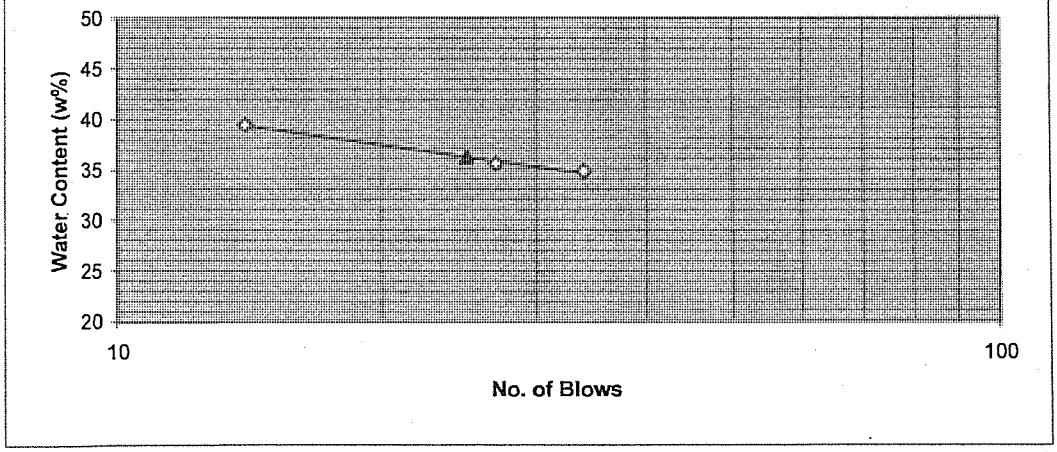
Terracon

Laboratory Test Results of Atterberg Limits ASTM D4318

Project:	KPRG Laboratory Testing		Job No:	58055075	
			CS-GT-2		
Location of project:		Boring No:	(top)	Sample Depth:	10'-12'
Description of Soil:	Sand, fine to coarse grained, gray	Tested By:	KF		

Liquid Limit Determination:

Can no.	49	115	119	
Mass of wet soil + can, gm	46.68	45.43	55.20	
Mass of dry soil + can, gm	42.72	41.78	48.39	
Mass of Can, gm	31.36	31.53	31.12	
Mass of dry soil, gm	11.36	10.25	17.27	
Mass of moisture, gm	3.96	3.65	6.81	
Water Content, w%	34.86	35.61	39.43	
No. of Blows	34	27	14	
Notes				



Plastic Limit Determination:

Can no.	400	109		
Mass of wet soil + can, gm	46.90	49.62		
Mass of dry soil + can, gm	44.49	46.83		
Mass of Can, gm	31.25	31.21		
Mass of dry soil, gm	13.24	15.62		
Mass of moisture, gm	2.41	2.79		
Water Content, w%	18.20	17.86		

Liquid Limit	36
Plastic Limit	18
Plasticity Index	18

By: TK

Terracon Consultants

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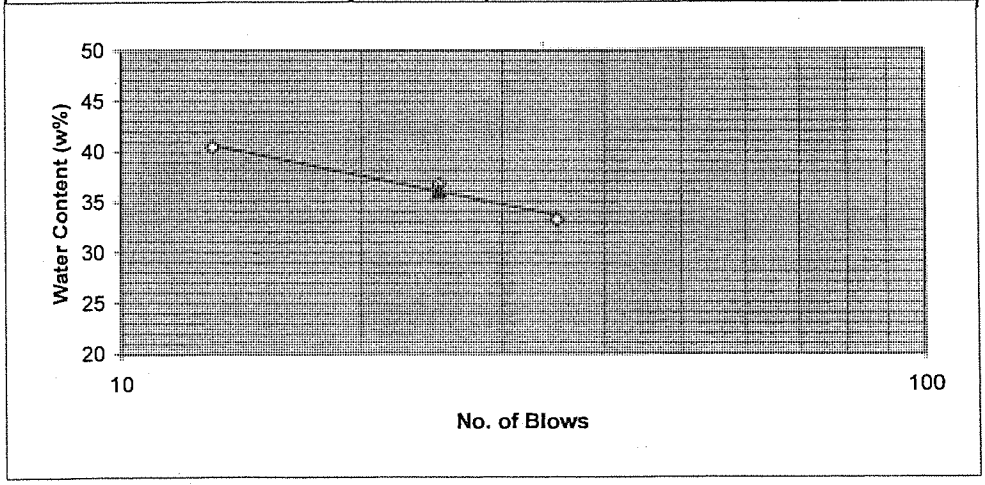
Terracon

Laboratory Test Results of Atterberg Limits ASTM D4318

Project:	KPRG Laboratory Testing		Job No:	58055075	
Location of project:		Boring No:	CS-GT-2 (Bottom)	Sample Depth:	10'-12'
Description of Soil:	Lean Clay, trace sand, gray	Tested By:	KF		

Liquid Limit Determination:

Can no.	456	400D	52A	
Mass of wet soil + can, gm	50.10	54.66	57.12	
Mass of dry soil + can, gm	45.51	48.37	49.64	
Mass of Can, gm	31.71	31.24	31.14	
Mass of dry soil, gm	13.80	17.13	18.50	
Mass of moisture, gm	4.59	6.29	7.48	
Water Content, w%	33.26	36.72	40.43	
No. of Blows	35	25	13	
Notes				



Plastic Limit Determination:

Can no.	109	115		
Mass of wet soil + can, gm	40.97	39.71		
Mass of dry soil + can, gm	39.51	38.49		
Mass of Can, gm	31.21	31.53		
Mass of dry soil, gm	8.30	6.96		
Mass of moisture, gm	1.46	1.22		
Water Content, w%	17.59	17.53		

Liquid Limit	**36**
Plastic Limit	**18**
Plasticity Index	**19**

By: TK
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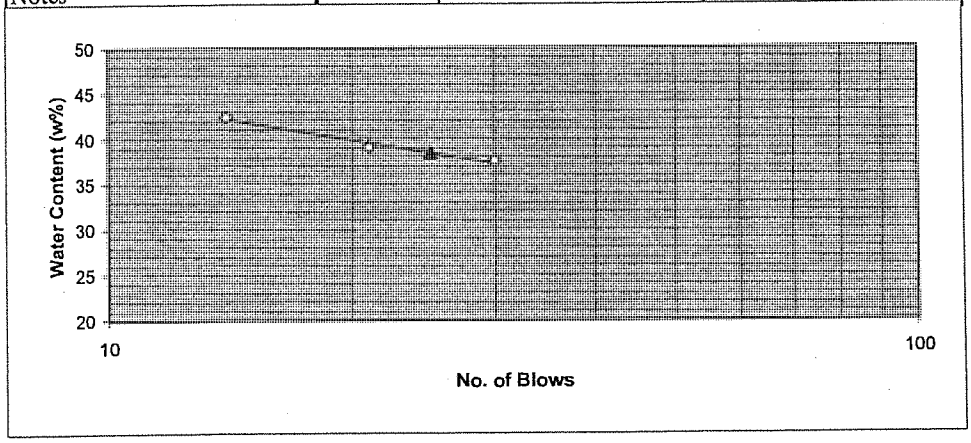
Terracon

Laboratory Test Results of Atterberg Limits ASTM D4318

Project:	KPRG Laboratory Testing		Job No:	58055075	
Location of project:		Boring No:	CS-GT-4	Sample Depth:	5'-7'
Description of Soil:	Lean Clay, trace sand and gravel, gray	Tested By:	KF		

Liquid Limit Determination:

Can no.	BJ	DE	CC	
Mass of wet soil + can, gm	41.32	44.93	43.45	
Mass of dry soil + can, gm	35.78	38.32	36.70	
Mass of Can, gm	21.03	21.40	20.79	
Mass of dry soil, gm	14.75	16.92	15.91	
Mass of moisture, gm	5.54	6.61	6.75	
Water Content, w%	37.56	39.07	42.43	
No. of Blows	30	21	14	
Notes				



Plastic Limit Determination:

Can no.	DW	456		
Mass of wet soil + can, gm	29.94	42.32		
Mass of dry soil + can, gm	28.48	40.56		
Mass of Can, gm	21.15	31.74		
Mass of dry soil, gm	7.33	8.82		
Mass of moisture, gm	1.46	1.76		
Water Content, w%	19.92	19.95		

Liquid Limit	38
Plastic Limit	20
Plasticity Index	19

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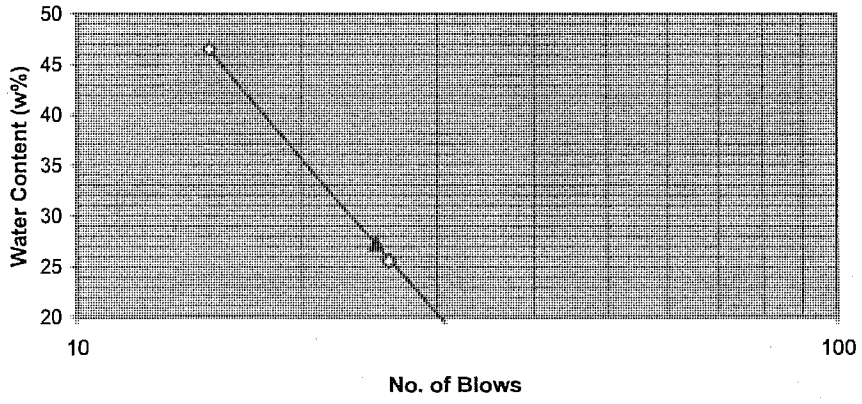
Terracon

Laboratory Test Results of Atterberg Limits ASTM D4318

Project:	KPRG Laboratory Testing		Job No:	58055075	
Location of project:		Boring No:	CS-GT-5	Sample Depth:	5'-7.5'
Description of Soil:	Lean Clay, with sand, brown and gray	Tested By:	KF		

Liquid Limit Determination:

Can no.	33	DR	BC	
Mass of wet soil + can, gm	47.30	45.06	43.52	
Mass of dry soil + can, gm	45.27	40.13	36.29	
Mass of Can, gm	32.45	20.82	20.73	
Mass of dry soil, gm	12.82	19.31	15.56	
Mass of moisture, gm	2.03	4.93	7.23	
Water Content, w%	15.83	25.53	46.47	
No. of Blows	34	26	15	
Notes				



Plastic Limit Determination:

Can no.	400-A	52-A		
Mass of wet soil + can, gm	41.20	39.92		
Mass of dry soil + can, gm	39.83	39.90		
Mass of Can, gm	31.87	28.06		
Mass of dry soil, gm	7.96	11.84		
Mass of moisture, gm	1.37	0.02		
Water Content, w%	17.21	0.17		

Liquid Limit	27
Plastic Limit	9
Plasticity Index	19

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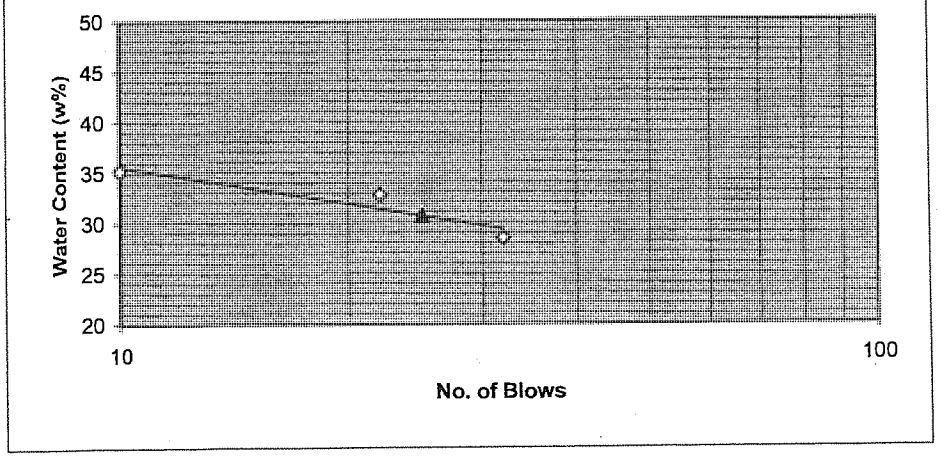
Laboratory Test Results of Atterberg Limits ASTM D4318

Project:	KPRG Laboratory Testing		Job No:	58055075	
Location of project:		Boring No:	CS-GT-6	Sample Depth:	10'-12.5'
Description of Soil:	Sandy Lean Clay, with gravel, brown and dark	Tested By:	KF		

Liquid Limit Determination:

Can no.	AC	49	119	
Mass of wet soil + can, gm	48.64	57.98	54.65	
Mass of dry soil + can, gm	42.52	51.40	48.55	
Mass of Can, gm	21.03	31.34	31.22	
Mass of dry soil, gm	21.49	20.06	17.33	
Mass of moisture, gm	6.12	6.58	6.10	
Water Content, w%	28.48	32.80	35.20	
No. of Blows	32	22	10	
Notes				



Plastic Limit Determination:

Can no.	59	131		
Mass of wet soil + can, gm	39.33	37.76		
Mass of dry soil + can, gm	38.07	36.78		
Mass of Can, gm	31.24	31.13		
Mass of dry soil, gm	6.83	5.65		
Mass of moisture, gm	1.26	0.98		
Water Content, w%	18.45	17.35		

Liquid Limit	31
Plastic Limit	18
Plasticity Index	13

By: TK
Terracon Consultants

3 pt. ATTERBERG

LIQUID LIMIT DETERMINATION

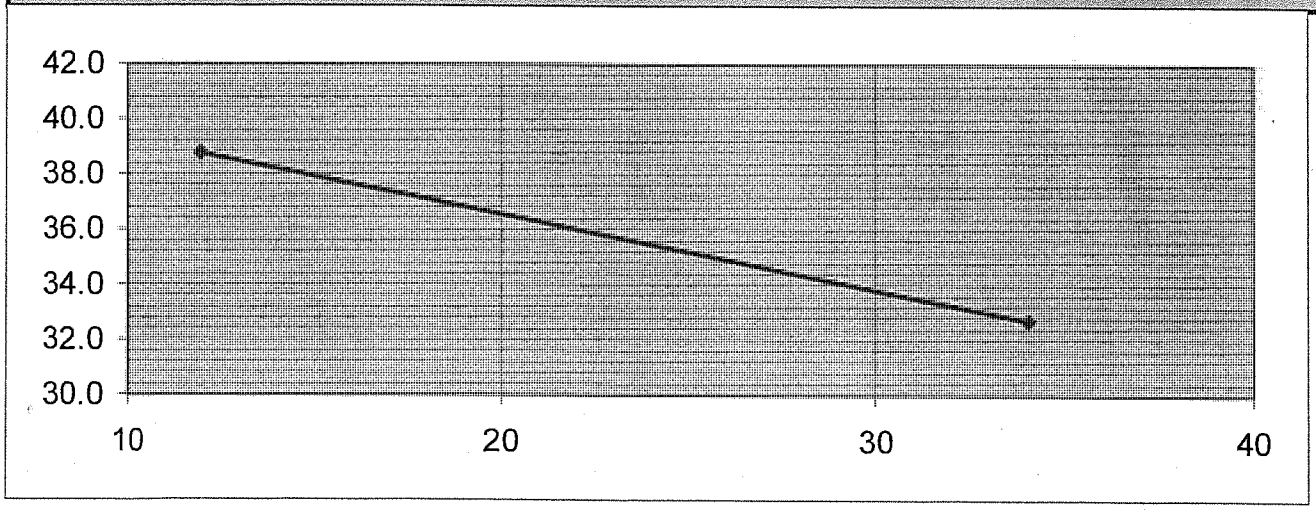
POINT No.	POINT 1	POINT 2	POINT 3	POINT 4
WET SOIL + TARE	9.92	13.87	13.87	
DRY SOIL + TARE	7.79	10.35	10.35	
TARE	1.28	1.27	1.27	
No. OF BLOWS	34	12	12	
MOISTURE %	**32.7**	**38.8**	**38.8**	**#DIV/0!**
CORECTION FACT.	1.000	1.000	1.000	1.000
MOISTURE @ 25	**32.7**	**38.8**	**38.8**	**#DIV/0!**

PLASTIC LIMIT DETERMINATION

POINT No.	POINT 1	POINT 2
WET SOIL + TARE	11.32	10.51
DRY SOIL + TARE	9.42	8.81
TARE	1.26	1.29
MOISTURE %	**23.3**	**22.6**

For 3 pts.		
L.L.	P.L.	P.I.
34.5	**22.9**	**11.6**

For 4 pts.		
L.L.	P.L.	P.I.
#VALUE!	**23**	**#VALUE!**



Project : KPRG Laboratory Testing
Project No. : 58055075
Location : WCGT-3, 3 to 8' Top of Sample
Description : Lean Clay, dark brown

TK

3 pt. ATTERBERG

LIQUID LIMIT DETERMINATION

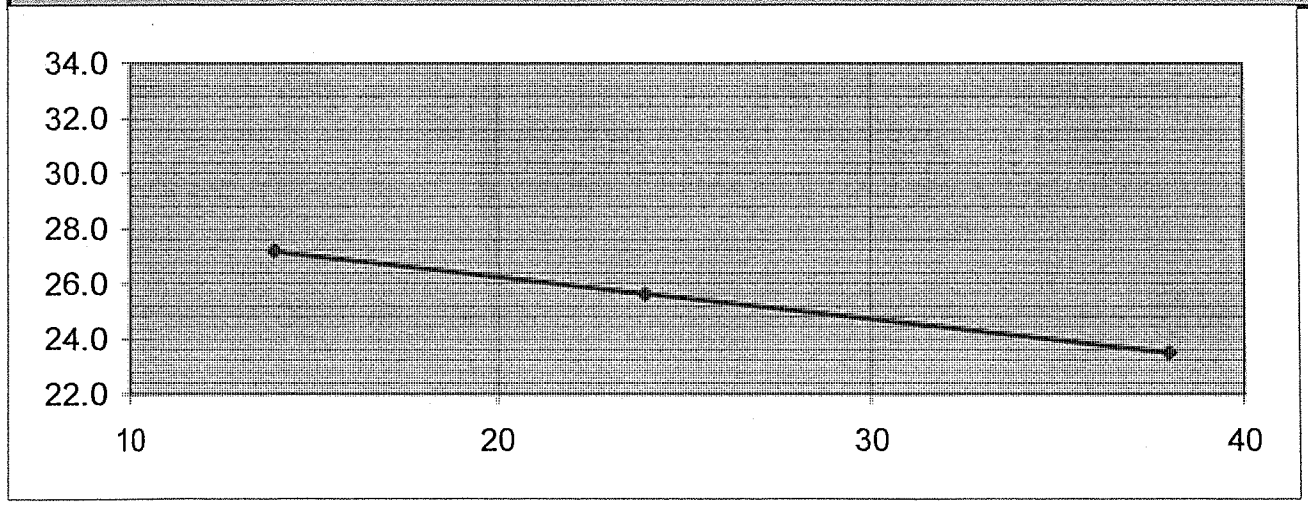
POINT No.	POINT 1	POINT 2	POINT 3	POINT 4
WET SOIL + TARE	19.50	21.32	24.54	
DRY SOIL + TARE	17.37	18.86	21.29	
TARE	8.31	9.26	9.34	
No. OF BLOWS	38	24	14	
MOISTURE %	**23.5**	**25.6**	**27.2**	**#DIV/0!**
CORECTION FACT.	1.000	1.000	1.000	1.000
MOISTURE @ 25	**23.5**	**25.6**	**27.2**	**#DIV/0!**

PLASTIC LIMIT DETERMINATION

POINT No.	POINT 1	POINT 2
WET SOIL + TARE	25.62	28.26
DRY SOIL + TARE	23.04	25.27
TARE	9.07	9.35
MOISTURE %	**18.5**	**18.8**

For 3 pts.		
L.L.	P.L.	P.I.
25.2	**18.6**	**6.6**

For 4 pts.		
L.L.	P.L.	P.I.
#VALUE!	**19**	**#VALUE!**



Project : KPRG Laboratory Testing
Project No. : 58055075
Location : WCGT-4, Btm of Sample From 5 to 10'
Description : Silty Clay, dark brown

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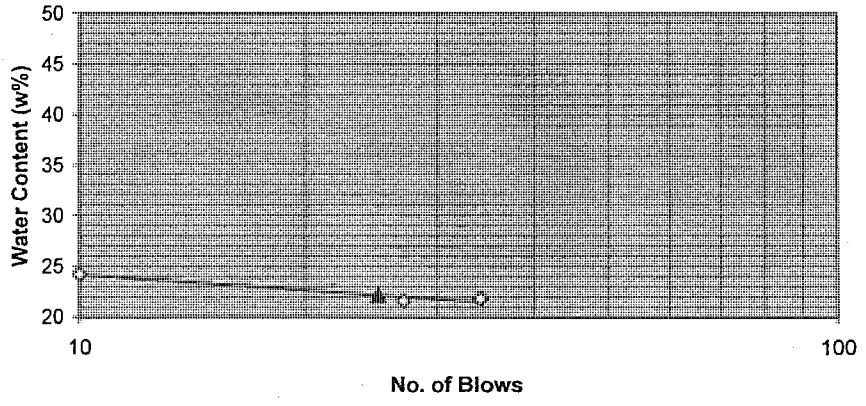
Terracon

Laboratory Test Results of Atterberg Limits ASTM D4318

Project:	KPRG Laboratory Testing		Job No:	58055075	
Location of project:		Boring No:	PS-GT-2	Sample Depth:	7'-8.5'
Description of Soil:	Clayey Sand, trace gravel, medium to coarse grained, brown	Tested By:	KF		

Liquid Limit Determination:

Can no.	59	BQ	1Q	
Mass of wet soil + can, gm	55.18	52.21	59.59	
Mass of dry soil + can, gm	50.89	46.74	54.11	
Mass of Can, gm	31.22	21.40	31.50	
Mass of dry soil, gm	19.67	25.34	22.61	
Mass of moisture, gm	4.29	5.47	5.48	
Water Content, w%	21.81	21.59	24.24	
No. of Blows	34	27	10	
Notes				



Plastic Limit Determination: **Unable to perform, too sandy**

Can no.				
Mass of wet soil + can, gm				
Mass of dry soil + can, gm				
Mass of Can, gm				
Mass of dry soil, gm				
Mass of moisture, gm				
Water Content, w%				

Liquid Limit	22
Plastic Limit	N/A
Plasticity Index	N/A

By: TLS

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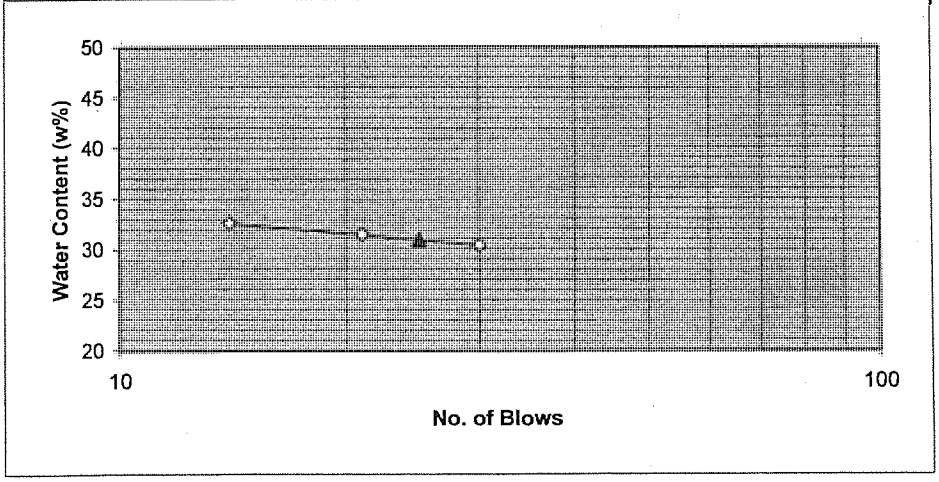
Terracon

Laboratory Test Results of Atterberg Limits ASTM D4318

Project:	KPRG Laboratory Testing		Job No:	58055075	
Location of project:		Boring No:	PS-GT-3	Sample Depth:	7'-9'
Description of Soil:	Sand, trace clay, organics, and gravel, dark brown	Tested By:	KF		

Liquid Limit Determination:

Can no.	FP	EK	BA	
Mass of wet soil + can, gm	42.58	43.90	46.56	
Mass of dry soil + can, gm	37.67	38.51	40.43	
Mass of Can, gm	21.52	21.39	21.61	
Mass of dry soil, gm	16.15	17.12	18.82	
Mass of moisture, gm	4.91	5.39	6.13	
Water Content, w%	30.40	31.48	32.57	
No. of Blows	30	21	14	
Notes				



Plastic Limit Determination:

Can no.	BN	46		
Mass of wet soil + can, gm	30.73	39.43		
Mass of dry soil + can, gm	29.37	38.28		
Mass of Can, gm	21.36	31.01		
Mass of dry soil, gm	8.01	7.27		
Mass of moisture, gm	1.36	1.15		
Water Content, w%	16.98	15.82		

Liquid Limit	**31**
Plastic Limit	**16**
Plasticity Index	**15**

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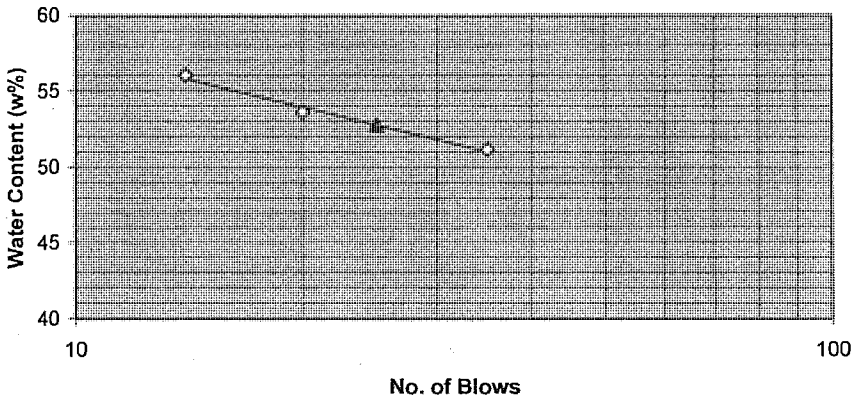
Laboratory Test Results of Atterberg Limits ASTM D4318

Project:	KPRG Laboratory Testing		Job No:	58055075	
Location of project:		Boring No:	PS-GT-5	Sample Depth:	17'-19'
Description of Soil:	Sandy Lean Clay, trace gravel, dark brown	Tested By:	KF		

Liquid Limit Determination:

Can no.	AU	AC	EB	
Mass of wet soil + can, gm	38.74	47.26	41.01	
Mass of dry soil + can, gm	32.78	38.09	34.09	
Mass of Can, gm	21.13	20.99	21.75	
Mass of dry soil, gm	11.65	17.10	12.34	
Mass of moisture, gm	5.96	9.17	6.92	
Water Content, w%	51.16	53.63	56.08	
No. of Blows	35	20	14	
Notes				



Plastic Limit Determination:

Can no.	BM	AN		
Mass of wet soil + can, gm	31.90	29.18		
Mass of dry soil + can, gm	29.70	27.60		
Mass of Can, gm	21.12	21.52		
Mass of dry soil, gm	8.58	6.08		
Mass of moisture, gm	2.20	1.58		
Water Content, w%	25.64	25.99		

Liquid Limit	53
Plastic Limit	26
Plasticity Index	27

By: TK

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1pt. ATTERBERG

LIQUID LIMIT DETERMINATION

POINT No.	POINT 1	POINT 2
WET SOIL + TARE	18.67	15.48
DRY SOIL + TARE	16.27	13.52
TARE	1.28	1.30
No. OF BLOWS	19	16
MOISTURE %	16.0	16.0
CORECTION FACT.	0.967	0.947
MOISTURE @ 25	15.5	15.2

PLASTIC LIMIT DETERMINATION

POINT No.	POINT 1	POINT 2
WET SOIL + TARE	15.45	12.46
DRY SOIL + TARE	13.58	10.99
TARE	1.35	1.30
MOISTURE %	15.3	15.2

L.L.	16	16
L.L. @ 25 BLOWS	15	15
PLASTIC LIMITS	15	15
PLASTIC INDEX	0	0

Project : KPRG Laboratory Testing
Project No. : 58055075
Location : JS29GT-1
Description : Sandy Gravel, trace clay, dark yellow

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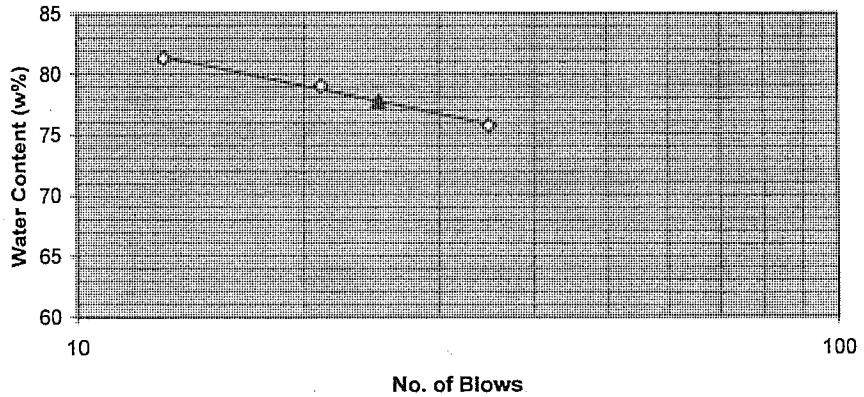
Laboratory Test Results of Atterberg Limits ASTM D4318

Project:	KPRG Laboratory Testing	Job No:	58055075
Location of project:		Boring No:	JS-29-GT-6 Sample Depth: 11-14'
Description of Soil:	Organic Silt, dark gray and black	Tested By:	MZ

Liquid Limit Determination:

Can no.	131	CE	400C	
Mass of wet soil + can, gm	35.84	25.29	35.20	
Mass of dry soil + can, gm	33.81	23.48	33.37	
Mass of Can, gm	31.13	21.19	31.12	
Mass of dry soil, gm	2.68	2.29	2.25	
Mass of moisture, gm	2.03	1.81	1.83	
Water Content, w%	75.75	79.04	81.33	
No. of Blows	35	21	13	
Notes				



Plastic Limit Determination:

Can no.	119	DU		
Mass of wet soil + can, gm	37.16	29.96		
Mass of dry soil + can, gm	35.31	26.24		
Mass of Can, gm	31.26	21.33		
Mass of dry soil, gm	4.05	4.91		
Mass of moisture, gm	1.85	3.72		
Water Content, w%	45.68	75.76		

Liquid Limit	78
Plastic Limit	61
Plasticity Index	17

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Terracon Consultants

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MEASUREMENT OF HYDRAULIC CONDUCTIVITY OF SATURATED POROUS MATERIALS
USING A FLEXIBLE WALL PERMEAMETER
ASTM D 5084 - 03 METHOD C TEST WITH INCREASING TAILWATER LEVEL
FLUID: DEAIRED TAP WATER WITH 0.005 N CaSO4

PROJECT: KPRG LABORATORY TESTING — TERRACON JOB #: 58055075 — DATE: 10/7/2005

SAMPLE ID: CS-GT-1 5-7' — -#4 MATERIAL

DESCR.: Sand, fine to coarse grained, trace gravel and silt, brown, dark brown and black

Durham Perm Cell — BURETTE Area 0.317 cm^2

INITIAL

MOISTURE%		DENSITY			
W & T, g	88.50	WET WT, g	195.8		
D & T, g	82.00	DIA, in	1.94	4.93	cm
T, g	19.37	HT, in	1.96	4.98	cm
		AREA		19.05	cm^2
MOIST-URE, %	10.4	DENSITY:	128.9	PCF WET	
		DENSITY:	116.8	PCF DRY	

SPEC GRAV:	2.700	REMOLD (Y/N):	YES
POROSITY, %:	30.7	PROCTOR:	NA
SATURATION, %:	63.3	OPTIMUM:	NA
VOID RATIO:	0.44	COMPACTION, %:	#VALUE!
		OVER OPTIMUM, %:	#VALUE!

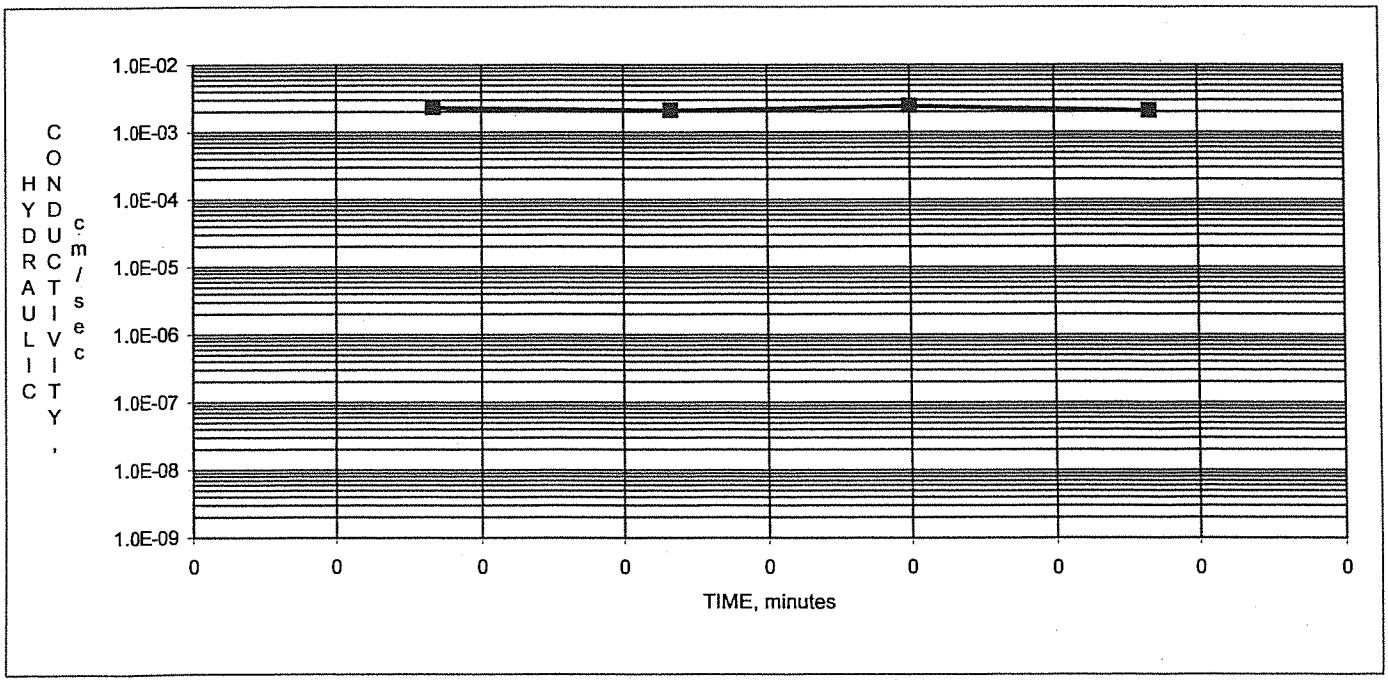
SATURATION:	LATERAL PRESS.:	105.0	psi	BACK PRESSURE (=UPPER=LOWER):	100.0 psi
TEST:	LATERAL PRESS.:	105.0	psi	UPPER: 100.0 psi	LOWER: 100.0 psi
				BIAS PRESSURE (=LOWER-UPPER)	0.0 psi

Upper cm^3	Lower cm^3	ELAPSED TIME, min	DELTA H cm	Ln H1/H2	HYD CON k, cm/sec	OUT FLOW cm^3	IN FLOW cm^3	OUT/IN RATIO	HYD GRAD	% FROM MEAN k	TEMP.: C	TEMP. CORR.:
20.8	30.1	0	9.3									
21.8	28.8	0	7.0	0.284104	2.31E-03	1.0	1.3	0.77	1.4	3	21	0.980
22.6	28.0	0	5.4	0.259511	2.11E-03	0.8	0.8	1.00	1.1	6	21	0.980
23.2	27.2	0	4.0	0.300105	2.44E-03	0.6	0.8	0.75	0.8	9	21	0.980
23.8	26.9	0	3.1	0.254892	2.07E-03	0.6	0.3	2.00	0.6	7	21	0.980

HYDRAULIC CONDUCTIVITY (k) = AVERAGE 2.2E-03 cm/sec

MAXIMUM HYDRAULIC GRADIENT	1.0E-03 TO 1.0E-04	2	0.75< RATIO <1.25	% < 25 AT > 1.0E-8 OR % < 50 AT < 1.0E-8
	1.0E-04 TO 1.0E-05	5		
	1.0E-05 TO 1.0E-06	10		
	1.0E-06 TO 1.0E-07	20		
	1.0E-07 TO 1.0E-10	30		

NUMBER OF PORE VOLUMES PASSED = 0.0327



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MEASUREMENT OF HYDRAULIC CONDUCTIVITY OF SATURATED POROUS MATERIALS
USING A FLEXIBLE WALL PERMEAMETER
ASTM D 5084 - 03 METHOD C TEST WITH INCREASING TAILWATER LEVEL
FLUID: DEAIRED TAP WATER WITH 0.005 N CaSO4

PROJECT: KPRG LABORATORY TESTING TERRACON JOB #: 58055075
DATE: 9/20/2005

SAMPLE
ID: CS-GT-5 5.0' - 7.5'
DESCR.: SILTY CLAY, WITH SAND, BROWN & GRAY

Durham Perm Cell
BURETTE Area 0.317 cm^2

INITIAL

MOISTURE%		DENSITY			
W & T, g	79.26	WET WT, g	229.7		
D & T, g	68.61	DIA, in	2.00	5.09	cm
T, g	20.38	HT, in	2.19	5.56	cm
		AREA		20.36	cm^2
MOIST-		DENSITY:	126.6	PCF WET	
URE, %	**22.1**	DENSITY:	**103.7**	PCF DRY	

SPEC GRAV:	2.700	REMOLD (Y/N):	YES
POROSITY, %:	38.5	PROCTOR:	112.4
SATURATION, %:	95.3	OPTIMUM:	22.0
VOID RATIO:	0.63	COMPACTION, %:	92.3
		OVER OPTIMUM, %:	0.1

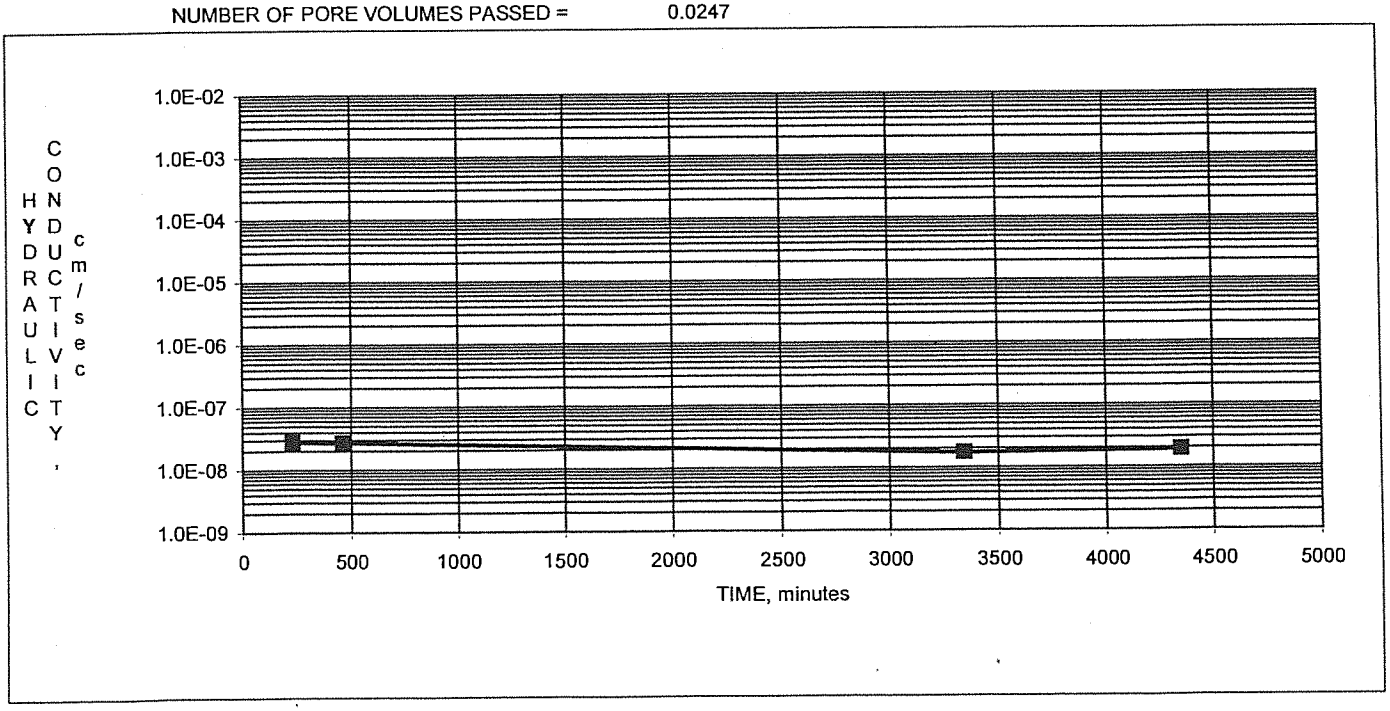
SATURATION:	LATERAL PRESS.:	105.0	psi	BACK PRESSURE (=UPPER=LOWER):	100.0 psi
TEST:	LATERAL PRESS.:	105.0	psi	UPPER: 100.0 psi	LOWER: 100.0 psi
				BIAS PRESSURE (=LOWER-UPPER)	0.0 psi

Upper cm^3	Lower cm^3	ELAPSED TIME, min	DELTA H cm	Ln H1/H2	HYD CON k, cm/sec	OUT FLOW cm^3	IN FLOW cm^3	OUT/IN RATIO	HYD GRAD	% FROM MEAN k	TEMP.: C	TEMP. CORR.:
4.1	70.2	0	66.1									
4.4	69.9	229	65.5	0.009119	2.75E-08	0.3	0.3	1.00	11.8	21	22	0.956
4.7	69.6	461	64.9	0.009203	2.74E-08	0.3	0.3	1.00	11.7	20	22	0.956
6.7	67.2	3345	60.5	0.070204	1.72E-08	2.0	2.4	0.83	10.9	24	21	0.980
7.5	66.4	4351	58.9	0.026802	1.88E-08	0.8	0.8	1.00	10.6	17	21	0.980

HYDRAULIC CONDUCTIVITY (k) = AVERAGE 2.3E-08 cm/sec

MAXIMUM HYDRAULIC GRADIENT	1.0E-03 TO 1.0E-04	2	0.75< RATIO <1.25	% < 25 AT > 1.0E-8 OR % < 50 AT < 1.0E-8
	1.0E-04 TO 1.0E-05	5		
	1.0E-05 TO 1.0E-06	10		
	1.0E-06 TO 1.0E-07	20		
	1.0E-07 TO 1.0E-10	30		

NUMBER OF PORE VOLUMES PASSED = 0.0247



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PERMEABILITY TEST ON GRANULAR SOIL
ASTM D 2434

Project Number 58055075 Project Name KPRG Laboratory Testing

Test Number _____ Date 9/14/2005

Location of Sample WSGT-1 Sampled _____ Report _____

Boring- _____ Sample- _____ Depth- 5 to 10'

Description of Soil Sand, fine, trace gravel, light brown

Materials Used: _____

Unit Weight Determination:

Diameter, D, cm 7.62 Wt. Soil (lb.) 1.170

Area, A, cm^2 45.60 Moisture Content _____

Length, L, cm 6.350000 Volume (ft^3) 0.01023

Dry Density 114.4

Degree of Compactness Unknown- No proctor available

Test No.	Head,h(cm)	Q (cm^3)	t (s)	QL	Ath	Velocity (Q/At)	Hyd. Grad. (h/L)	Temp, C.	Temp. Corr.	k (cm/s)
1	7	20	38.5	127	12290.2	0.01139	1.10236	20	1.000	1.03E-02
2	17.2	20	15.5	127	12157.9	0.02829	2.70866	20	1.000	1.04E-02
3	24.3	20	11	127	12189.9	0.03987	3.82677	20	1.000	1.04E-02
4	29.8	20	9	127	12230.9	0.04873	4.69291	20	1.000	1.04E-02
5	33.2	20	8.2	127	12415.1	0.05348	5.22835	20	1.000	1.02E-02
6	37.5	20	6.8	127	11628.9	0.06449	5.90551	20	1.000	1.09E-02
7	40.9	20	6.5	127	12123.7	0.06747	6.44094	20	1.000	1.05E-02
8									Avg	1.05E-02
9										
10										
11										
12										

Note:

Tested by: Rowdy Miller Checked by: TK Trevor Kauffeld

Terracon

PERMEABILITY TEST ON GRANULAR SOIL
ASTM D 2434

Project Number 58055075 Project Name KPRG Laboratory Testing

Test Number _____ Date 9/13/2005

Location of Sample WS-GT-2 Sampled _____ Report _____

Boring- _____ Sample- _____ Depth- 7.5-10

Description of Soil Silty Sand, trace gravel, light brown

Materials Used: _____

Unit Weight Determination:

Diameter, D, cm 6.23 Wt. Soil (lb.) 0.798

Area, A, cm^2 30.48 Moisture Content 8.9

Length, L, cm 6.350000 Volume (ft^3) 0.00685

Dry Density 107.0

Degree of Compactness Unknown- No proctor available

Test No.	Head,h(cm)	Q (cm^3)	t (s)	QL	Ath	Velocity (Q/At)	Hyd. Grad. (h/L)	Temp, C.	Temp. Corr.	k (cm/s)
1	13.2	20	19.08	127	7677.47	0.03439	2.07874	20	1.000	1.65E-02
2	19.5	20	12.8	127	7608.7	0.05126	3.07087	20	1.000	1.67E-02
3	27.8	20	10.2	127	8643.92	0.06432	4.37795	20	1.000	1.47E-02
4	32.2	20	8.87	127	8706.53	0.07397	5.07087	20	1.000	1.46E-02
5	35	20	8.17	127	8716.77	0.0803	5.51181	20	1.000	1.46E-02
6	36.7	20	7.52	127	8412.97	0.08725	5.77953	20	1.000	1.51E-02
7	39.6	20	7.24	127	8739.76	0.09062	6.23622	20	1.000	1.45E-02
8	41	20	6.95	127	8686.29	0.0944	6.45669	20	1.000	1.46E-02
9									AVG	1.52E-02
10										
11										
12										

Note:

Tested by: Rowdy Miller Checked by: TK Trevor Kauffeld

Terracon

PERMEABILITY TEST ON GRANULAR SOIL
ASTM D 2434

Project Number 58055075 Project Name KPRG Laboratory Testing

Test Number _____ Date 9/13/2005

Location of Sample WS-GT-3 Sampled _____ Report _____

Boring- _____ Sample- Bottom Depth- 5 to 10'

Description of Soil Sand, fine, trace gravel, light brown

Materials Used: _____

Unit Weight Determination:

Diameter, D, cm 7.62 Wt. Soil (lb.) 1.120

Area, A, cm^2 45.60 Moisture Content 11.2

Length, L, cm 6.350000 Volume (ft^3) 0.01022

Dry Density 98.6

Degree of Compactness Unknown- No proctor available

Test No.	Head,h(cm)	Q (cm^3)	t (s)	QL	Ath	Velocity (Q/At)	Hyd. Grad. (h/L)	Temp, C.	Temp. Corr.	k (cm/s)
1	3.3	20	31.5	127	4740.5	0.01392	0.51969	20	1.000	2.68E-02
2	8.7	20	14	127	5554.52	0.03133	1.37008	20	1.000	2.29E-02
3	13.5	20	9.5	127	5848.67	0.04616	2.12598	20	1.000	2.17E-02
4	17.2	20	7	127	5490.68	0.06265	2.70866	20	1.000	2.31E-02
5	21.5	20	5.5	127	5392.63	0.07974	3.38583	20	1.000	2.36E-02
6	24.3	20	5	127	5540.84	0.08771	3.82677	20	1.000	2.29E-02
7	32.3	20	4	127	5891.99	0.10964	5.08661	20	1.000	2.16E-02
8	32.3	20	4	127	5891.99	0.10964	5.08661	20	1.000	2.16E-02
9									AVG	2.30E-02
10										
11										
12										

Note:

Tested by: Rowdy Miller Checked by: TK Trevor Kauffeld

Terracon

PERMEABILITY TEST ON GRANULAR SOIL
ASTM D 2434

Project Number 58055075 Project Name KPRG Laboratory Testing

Test Number _____ Date 9/13/2005

Location of Sample WSGT-4 Sampled _____ Report _____

Boring- _____ Sample- _____ Depth- 22 to 27'

Description of Soil Fine Sand Grading to a Fine To Coarse Sand With Gravel

Materials Used: Fine Sand @ Top of Sample.

Unit Weight Determination:

Diameter, D, cm 6.23 Wt. Soil (lb.) 0.822

Area, A, cm^2 30.48 Moisture Content 5.4

Length, L, cm 6.350000 Volume (ft^3) 0.00685

Dry Density 113.9

Degree of Compactness Unknown- No proctor available

Test No.	Head,h(cm)	Q (cm^3)	t (s)	QL	Ath	Velocity (Q/At)	Hyd. Grad. (h/L)	Temp, C.	Temp. Corr.	k (cm/s)
1	5.4	20	41.15	127	6773.75	0.01594	0.85039	22	0.953	1.79E-02
2	14.7	20	11.08	127	4965.04	0.05921	2.31496	22	0.953	2.44E-02
3	20.3	20	9.02	127	5581.72	0.07274	3.19685	22	0.953	2.17E-02
4	23.5	20	7.49	127	5365.56	0.0876	3.70079	22	0.953	2.26E-02
5	25.5	20	7.08	127	5503.5	0.09267	4.01575	22	0.953	2.20E-02
6	27.5	20	6.89	127	5775.87	0.09522	4.33071	22	0.953	2.10E-02
7	28	20	6.46	127	5513.87	0.10156	4.40945	22	0.953	2.20E-02
8									AVG	2.16E-02
9										
10										
11										
12										

Note:

Tested by: Rowdy Miller Checked by: TK Trevor Kauffeld

Terracon

PERMEABILITY TEST ON GRANULAR SOIL
ASTM D 2434

Project Number 58055075 Project Name KPRG Laboratory Testing

Test Number _____ Date 9/13/2005

Location of Sample WS-GT-5 Sampled _____ Report _____

Boring- _____ Sample- _____ Depth- 22-27

Description of Soil Sand, Fine to Coarse Grained, Trace Gravel, Black

Materials Used: _____

Unit Weight Determination:

Diameter, D, cm 5.08 Wt. Soil (lb.) 0.619

Area, A, cm^2 20.27 Moisture Content 4.4

Length, L, cm 8.260000 Volume (ft^3) 0.00591

Dry Density 100.3

Degree of Compactness Unknown- No proctor available

Test No.	Head,h(cm)	Q (cm^3)	t (s)	QL	Ath	Velocity (Q/At)	Hyd. Grad. (h/L)	Temp, C.	Temp. Corr.	k (cm/s)
1	210.9	2.01	1	99.6156	4274.58	0.09917	25.5327	20	1.000	2.33E-02
2	210.9	2.01	150	579.431	641187	0.00066	25.5327	20	1.000	9.04E-04
3										
4										
5										
6										
7										
8										
9									AVG	1.21E-02
10										
11										
12										

Note:

Tested by: Rowdy Miller Checked by: TK Trevor Kauffeld

Terracon

PERMEABILITY TEST ON GRANULAR SOIL
ASTM D 2434

Project Number 58055075 Project Name KPRG Laboratory Testing

Test Number _____ Date 9/29/2005

Location of Sample WC-GT-1 Sampled _____ Report _____

Boring- _____ Sample- _____ Depth- 5 to 10'

Description of Soil Clayey Sand, dark brown to tan

Materials Used: _____

Unit Weight Determination:

Diameter, D, cm 6.35 Dry Density 115.000

Area, A, cm^2 31.67 Moisture Content 3.4

Length, L, cm 6.350000

Degree of Compactness Unknown- No proctor available

Test No.	Head,h(cm)	Q (cm^3)	t (s)	QL	Ath	Velocity (Q/At)	Hyd. Grad. (h/L)	Temp, C.	Temp. Corr.	k (cm/s)
1	1.2	20	24	127	912.073	0.02631	0.18898	22	0.953	1.33E-01
2	2.6	20	14	127	1152.76	0.04511	0.40945	22	0.953	1.05E-01
3	4.1	20	10	127	1298.44	0.06315	0.64567	22	0.953	9.32E-02
4	5	20	8	127	1266.77	0.07894	0.7874	22	0.953	9.55E-02
5	5.3	20	8	127	1342.77	0.07894	0.83465	22	0.953	9.01E-02
6	5.5	20	8	127	1393.44	0.07894	0.86614	22	0.953	8.69E-02
7	6	20	8	127	1520.12	0.07894	0.94488	22	0.953	7.96E-02
8	6.8	20	7	127	302.26	0.44994	1.07087	22	0.953	4.00E-01
9									AVG	1.35E-01
10										
11										
12										

Note:

Tested by: Rowdy Miller Checked by: Trevor Kauffeld

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PERMEABILITY TEST ON GRANULAR SOIL
ASTM D 2434

Project Number 58055075 Project Name KPRG Laboratory Testing

Test Number _____ Date 9/13/2005

Location of Sample WC-GT-2 Sampled _____ Report _____

Boring- _____ Sample- _____ Depth- 5 to 10'

Description of Soil Sand, with gravel, dark brown

Materials Used: _____

Unit Weight Determination:

Diameter, D, cm 7.60 Dry Density 90.900

Area, A, cm^2 45.36 Moisture Content 18.1

Length, L, cm 6.350000

Degree of Compactness Unknown- No proctor available

Test No.	Head,h(cm)	Q (cm^3)	t (s)	QL	Ath	Velocity (Q/At)	Hyd. Grad. (h/L)	Temp, C.	Temp. Corr.	k (cm/s)
1	9.8	20	32.3	127	14359.7	0.01365	1.54331	20	1.000	8.84E-03
2	63	20	18.4	127	52586.6	0.02396	9.92126	20	1.000	2.42E-03
3	65	20	17.3	127	51012.4	0.02548	10.2362	20	1.000	2.49E-03
4	71	20	17.05	127	54916.1	0.02586	11.1811	20	1.000	2.31E-03
									AVG	4.02E-03

Note:

Tested by: Rowdy Miller Checked by: TK Trevor Kauffeld

Electronic Filing: Received, Clerk's Office 10/31/2022

MEASUREMENT OF HYDRAULIC CONDUCTIVITY OF SATURATED POROUS MATERIALS
USING A FLEXIBLE WALL PERMEAMETER
ASTM D 5084 - 03 METHOD C TEST WITH INCREASING TAILWATER LEVEL
FLUID: DEAIRED TAP WATER WITH 0.005 N CaSO4

PROJECT: KPRG LABORATORY TESTING TERRACON JOB #: 58055075
DATE: 9/20/2005

SAMPLE
ID: PS-GT-1 10.0'-12.0'
DESCR.: CLAYEY SAND/SANDY CLAY,WITH GRAVEL, DARK BROWN

Durham Perm Cell
BURETTE Area 0.317 cm^2

INITIAL

MOISTURE%		DENSITY			
W & T, g	68.74	WET WT, g	208.6		
D & T, g	65.16	DIA, in	2.00	5.08	cm
T, g	19.41	HT, in	2.04	5.19	cm
		AREA		20.29	cm^2
MOIST-		DENSITY:	123.6	PCF WET	
URE, %	7.8	DENSITY:	114.6	PCF DRY	

SPEC GRAV:	2.700	REMOLD (Y/N):	YES
POROSITY, %:	32.0	PROCTOR:	115.0
SATURATION, %:	44.9	OPTIMUM:	7.8
VOID RATIO:	0.47	COMPACTION, %:	99.7
		OVER OPTIMUM, %:	0.0

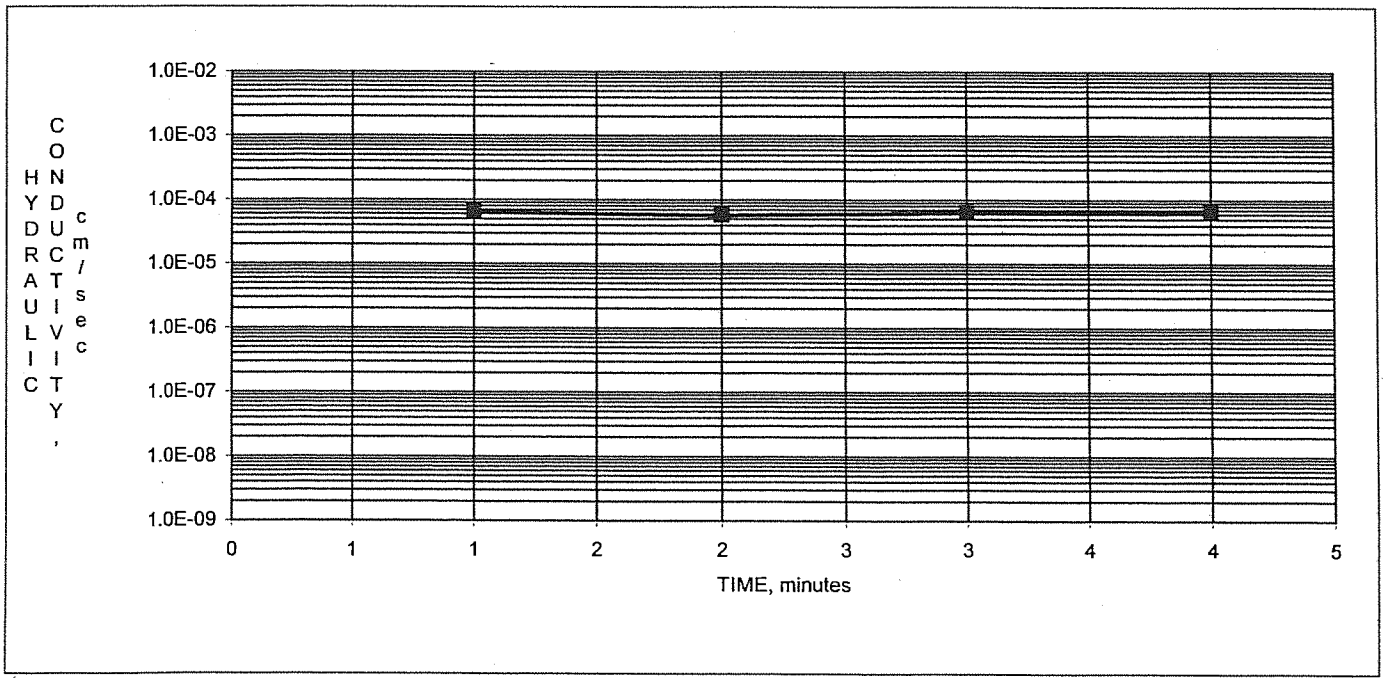
SATURATION:	LATERAL PRESS.:	105.0	psi	BACK PRESSURE (=UPPER=LOWER):	100.0 psi
TEST:	LATERAL PRESS.:	105.0	psi	UPPER: 100.0 psi	LOWER: 100.0 psi
				BIAS PRESSURE (=LOWER-UPPER)	0.0 psi

Upper cm^3	Lower cm^3	ELAPSED TIME, min	DELTA H cm	Ln H1/H2	HYD CON k, cm/sec	OUT FLOW cm^3	IN FLOW cm^3	OUT/IN RATIO	HYD GRAD	% FROM MEAN k	TEMP.: C	TEMP. CORR.:
24.7	43.2	0	18.5									
25.5	42.3	1	16.8	0.096392	6.39E-05	0.8	0.9	0.89	3.2	2	21	0.980
26.2	41.6	2	15.4	0.087011	5.76E-05	0.7	0.7	1.00	3.0	7	21	0.980
26.9	40.9	3	14.0	0.095310	6.31E-05	0.7	0.7	1.00	2.7	1	21	0.980
27.5	40.2	4	12.7	0.097455	6.46E-05	0.6	0.7	0.86	2.4	4	21	0.980

HYDRAULIC CONDUCTIVITY (k) = AVERAGE 6.2E-05 cm/sec

MAXIMUM	1.0E-03 TO 1.0E-04	2	0.75<	% < 25 AT
HYDRAULIC	1.0E-04 TO 1.0E-05	5	RATIO	> 1.0E-8
GRADIENT	1.0E-05 TO 1.0E-06	10	<1.25	OR
	1.0E-06 TO 1.0E-07	20		% < 50 AT
	1.0E-07 TO 1.0E-10	30		< 1.0E-8

NUMBER OF PORE VOLUMES PASSED = 0.0263



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MEASUREMENT OF HYDRAULIC CONDUCTIVITY OF SATURATED POROUS MATERIALS
USING A FLEXIBLE WALL PERMEAMETER
ASTM D 5084 - 03 METHOD C TEST WITH INCREASING TAILWATER LEVEL
FLUID: DEAIRED TAP WATER WITH 0.005 N CaSO4

PROJECT: KPRG LABORATORY TESTING TERRACON JOB #: 58055075
DATE: 9/20/2005

SAMPLE ID: PS-GT-2 7.0' TO8.5'
DESCR.: CLAYEY SAND, TRACE GRAVEL, MEDIUM COURSE, BROWN

Durham Perm Cell
BURETTE Area 0.317 cm^2

INITIAL

MOISTURE%		DENSITY			
W & T, g	74.82	WET WT, g	230.3		
D & T, g	70.08	DIA, in	1.99	5.06	cm
T, g	20.32	HT, in	2.03	5.16	cm
		AREA		20.09	cm^2
MOIST-		DENSITY:	138.7	PCF WET	
URE, %	9.5	DENSITY:	126.7	PCF DRY	

SPEC GRAV:	2.700	REMOLD (Y/N):	YES
POROSITY, %:	24.8	PROCTOR:	125.0
SATURATION, %:	77.8	OPTIMUM:	9.7
VOID RATIO:	0.33	COMPACTION, %:	101.3
		OVER OPTIMUM, %:	-0.2

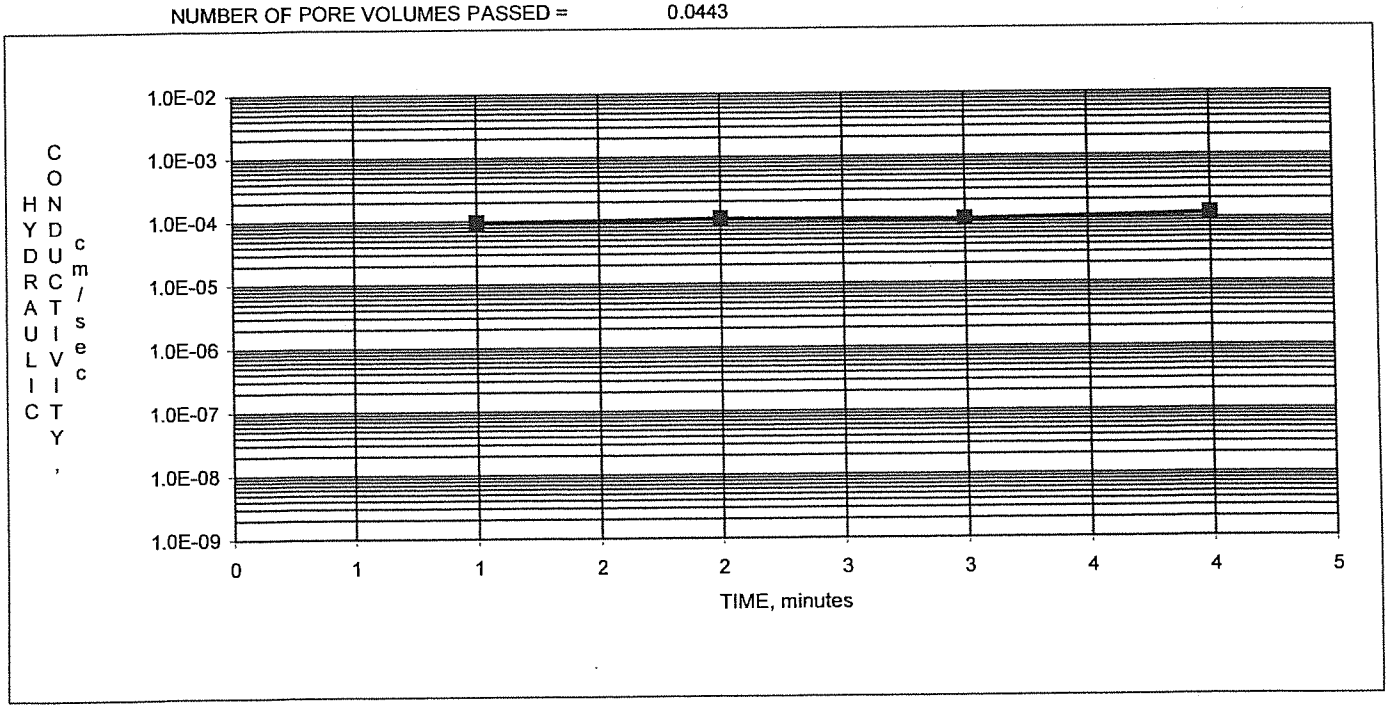
SATURATION:	LATERAL PRESS.:	105.0	psi	BACK PRESSURE (=UPPER=LOWER):	100.0 psi
TEST:	LATERAL PRESS.:	105.0	psi	UPPER: 100.0 psi	LOWER: 100.0 psi
				BIAS PRESSURE (=LOWER-UPPER)	0.0 psi

Upper cm^3	Lower cm^3	ELAPSED TIME, min	DELTA H cm	Ln H1/H2	HYD CON k, cm/sec	OUT FLOW cm^3	IN FLOW cm^3	OUT/IN RATIO	HYD GRAD	% FROM MEAN k	TEMP.: C	TEMP. CORR.:
20.8	37.2	0	16.4									
21.8	36.0	1	14.2	0.144039	9.58E-05	1.0	1.2	0.83	2.8	9	21	0.980
22.8	34.9	2	12.1	0.160037	1.06E-04	1.0	1.1	0.91	2.3	1	21	0.980
23.6	34.0	3	10.4	0.151400	1.01E-04	0.8	0.9	0.89	2.0	4	21	0.980
24.4	33.1	4	8.7	0.178483	1.19E-04	0.8	0.9	0.89	1.7	13	21	0.980

HYDRAULIC CONDUCTIVITY (k) = AVERAGE 1.1E-04 cm/sec

MAXIMUM HYDRAULIC GRADIENT	1.0E-03 TO 1.0E-04	2	0.75< RATIO <1.25	% < 25 AT > 1.0E-8 OR % < 50 AT < 1.0E-8
	1.0E-04 TO 1.0E-05	5		
	1.0E-05 TO 1.0E-06	10		
	1.0E-06 TO 1.0E-07	20		
	1.0E-07 TO 1.0E-10	30		

NUMBER OF PORE VOLUMES PASSED = 0.0443



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MEASUREMENT OF HYDRAULIC CONDUCTIVITY OF SATURATED POROUS MATERIALS
USING A FLEXIBLE WALL PERMEAMETER
ASTM D 5084 - 03 METHOD C TEST WITH INCREASING TAILWATER LEVEL
FLUID: DEAIRED TAP WATER WITH 0.005 N CaSO4

PROJECT: KPRG LABORATORY TESTING TERRACON JOB #: 58055075
DATE: 9/20/2005

SAMPLE ID: PS-GT-3 7.0'-9.0'
DESCR.: SAND, WITH CLAY, TRACE GRAVEL & ORGANICS, DARK BROWN

Durham Perm Cell
BURETTE Area 0.317 cm^2

INITIAL

MOISTURE%		DENSITY			
W & T, g	79.03	WET WT, g	208.3		
D & T, g	72.30	DIA, in	1.99	5.06	cm
T, g	20.26	HT, in	2.02	5.12	cm
		AREA		20.13	cm^2
MOIST-		DENSITY:	126.2	PCF WET	
URE, %	12.9	DENSITY:	111.8	PCF DRY	

SPEC GRAV:	2.700	REMOLD (Y/N):	YES
POROSITY, %:	33.7	PROCTOR:	115.0
SATURATION, %:	68.7	OPTIMUM:	12.9
VOID RATIO:	0.51	COMPACTION, %:	97.2
		OVER OPTIMUM, %:	0.0

SATURATION:	LATERAL PRESS.:	105.0	psi	BACK PRESSURE (=UPPER=LOWER):	100.0 psi
TEST:	LATERAL PRESS.:	105.0	psi	UPPER: 100.0 psi	LOWER: 100.0 psi
				BIAS PRESSURE (=LOWER-UPPER)	0.0 psi

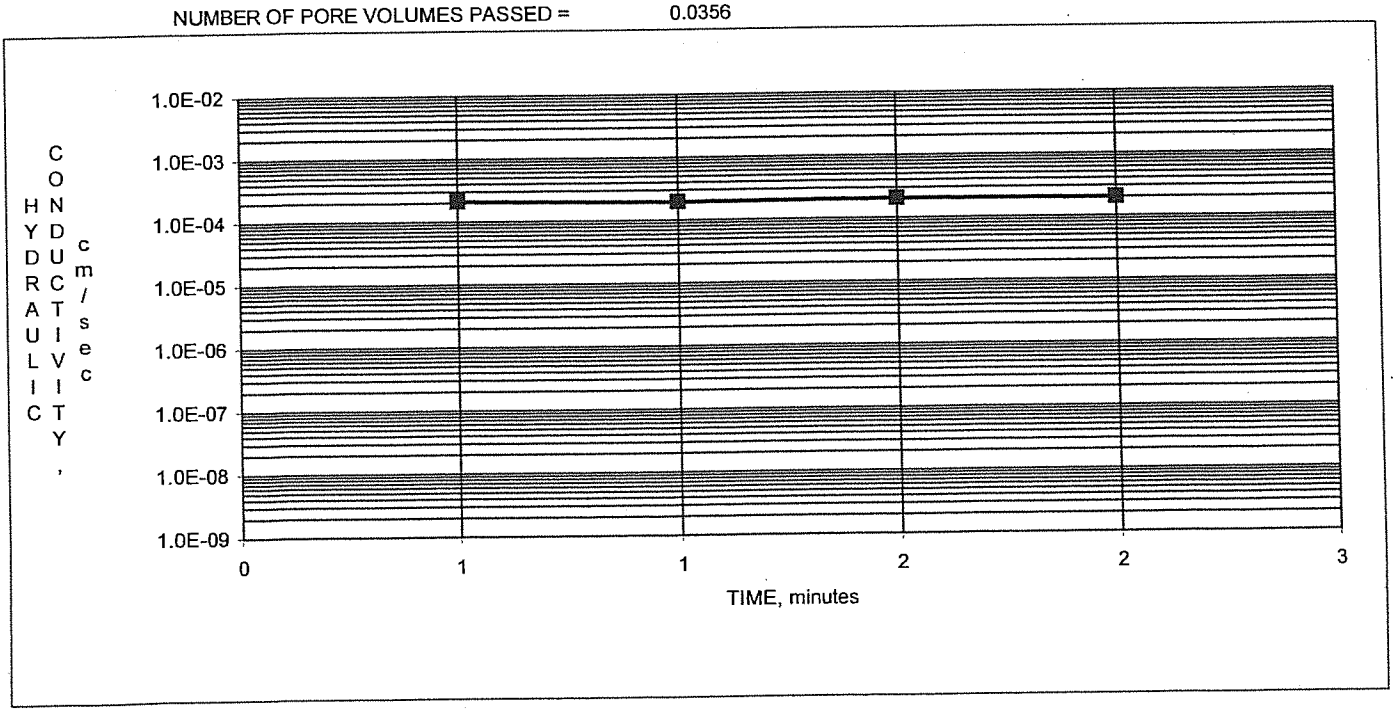
Upper cm^3	Lower cm^3	ELAPSED TIME, min	DELTA H cm	Ln H1/H2	HYD CON k, cm/sec	OUT FLOW cm^3	IN FLOW cm^3	OUT/IN RATIO	HYD GRAD	% FROM MEAN k	TEMP.: C	TEMP. CORR.:
22.1	39.1	0	17.0									
23.3	37.8	0	14.5	0.159065	2.09E-04	1.2	1.3	0.92	2.8	4	21	0.980
24.3	36.8	1	12.5	0.148420	1.95E-04	1.0	1.0	1.00	2.4	3	21	0.980
25.2	35.9	1	10.7	0.155485	2.05E-04	0.9	0.9	1.00	2.1	1	21	0.980
26.0	35.2	2	9.2	0.151040	1.99E-04	0.8	0.7	1.14	1.8	2	21	0.980

HYDRAULIC CONDUCTIVITY (k) = AVERAGE 2.0E-04 cm/sec

MAXIMUM HYDRAULIC GRADIENT		
1.0E-03 TO 1.0E-04	2	0.75< RATIO <1.25
1.0E-04 TO 1.0E-05	5	
1.0E-05 TO 1.0E-06	10	
1.0E-06 TO 1.0E-07	20	
1.0E-07 TO 1.0E-10	30	

% < 25 AT > 1.0E-8 OR % < 50 AT < 1.0E-8

NUMBER OF PORE VOLUMES PASSED = 0.0356



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MEASUREMENT OF HYDRAULIC CONDUCTIVITY OF SATURATED POROUS MATERIALS
USING A FLEXIBLE WALL PERMEAMETER
ASTM D 5084 - 03 METHOD C TEST WITH INCREASING TAILWATER LEVEL
FLUID: DEAIRED TAP WATER WITH 0.005 N CaSO4

PROJECT: KPRG LABORATORY TESTING TERRACON JOB #: 58055075
DATE: 9/20/2005

SAMPLE ID: PS-GT-4
DESCR.: SAND, WITH CLAY & GRAVEL, TRACE ORGANICS, FINE TO COURSE GRAINED, DARK BROWN

Durham Perm Cell
BURETTE Area 0.317 cm^2

INITIAL

MOISTURE%		DENSITY			
W & T, g	66.57	WET WT, g	223.0		
D & T, g	60.35	DIA, in	1.97	5.00	cm
T, g	20.37	HT, in	2.08	5.29	cm
		AREA		19.66	cm^2
MOIST-		DENSITY:	133.9	PCF WET	
URE, %	15.6	DENSITY:	115.9	PCF DRY	

SPEC GRAV:	2.700	REMOLD (Y/N):	YES
POROSITY, %:	31.2	PROCTOR:	115.0
SATURATION, %:	92.5	OPTIMUM:	15.7
VOID RATIO:	0.45	COMPACTION, %:	100.8
		OVER OPTIMUM, %:	-0.1

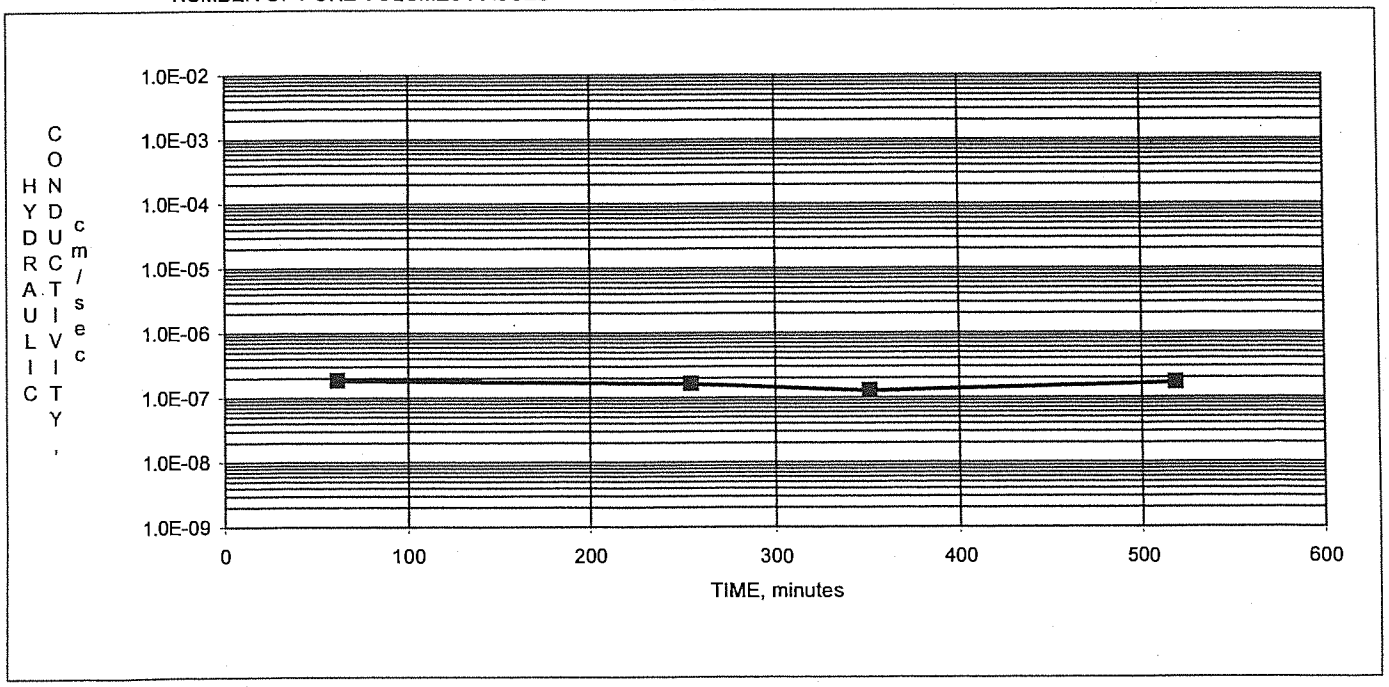
SATURATION:	LATERAL PRESS.:	105.0	psi	BACK PRESSURE (=UPPER=LOWER):	100.0 psi
TEST:	LATERAL PRESS.:	105.0	psi	UPPER: 100.0 psi	LOWER: 100.0 psi
				BIAS PRESSURE (=LOWER-UPPER)	0.0 psi

Upper cm^3	Lower cm^3	ELAPSED TIME, min	DELTA H cm	Ln H1/H2	HYD CON k, cm/sec	OUT FLOW cm^3	IN FLOW cm^3	OUT/IN RATIO	HYD GRAD	% FROM MEAN k	TEMP.: C	TEMP. CORR.:
4.1	71.3	0	67.2									
4.6	70.7	62	66.1	0.016505	1.85E-07	0.5	0.6	0.83	12.5	16	21	0.980
5.9	69.1	254	63.2	0.044864	1.63E-07	1.3	1.6	0.81	12.0	1	21	0.980
6.4	68.5	351	62.1	0.017558	1.26E-07	0.5	0.6	0.83	11.7	21	21	0.980
7.5	67.2	519	59.7	0.039414	1.67E-07	1.1	1.3	0.85	11.3	4	20	1.005

HYDRAULIC CONDUCTIVITY (k) = AVERAGE 1.6E-07 cm/sec

MAXIMUM HYDRAULIC GRADIENT			0.75< RATIO <1.25	% < 25 AT > 1.0E-8 OR % < 50 AT < 1.0E-8
	1.0E-03 TO 1.0E-04	2		
	1.0E-04 TO 1.0E-05	5		
	1.0E-05 TO 1.0E-06	10		
	1.0E-06 TO 1.0E-07	20		
	1.0E-07 TO 1.0E-10	30		

NUMBER OF PORE VOLUMES PASSED = 0.0332



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PERMEABILITY TEST ON GRANULAR SOIL
ASTM D 2434

Project Number 58055075 Project Name KPRG Laboratory Testing

Test Number _____ Date 10/1/2005

Location of Sample PS-GT-6 Sampled _____ Report _____

Boring- _____ Sample- _____ Depth- 13 to 18'

Description of Soil Sand, fine to coarse, trace gravel, trace rubble, dark brown

Materials Used: _____

Unit Weight Determination:

Diameter, D, cm 6.23 Dry Density 107.000

Area, A, cm^2 30.48 Moisture Content 4.3

Length, L, cm 6.350000

Degree of Compactness Unknown- No proctor available

Test No.	Head,h(cm)	Q (cm^3)	t (s)	QL	Ath	Velocity (Q/At)	Hyd. Grad. (h/L)	Temp, C.	Temp. Corr.	k (cm/s)
1	17.6	20	25.1	127	13466.4	0.02614	2.77165	22	0.953	8.99E-03
2	31.8	20	14.7	127	14249.8	0.04463	5.00787	22	0.953	8.49E-03
3	36.8	20	13	127	14583.3	0.05047	5.79528	22	0.953	8.30E-03
4	38.8	20	12.6	127	14902.8	0.05207	6.11024	22	0.953	8.12E-03
5	40.8	20	12.2	127	15173.5	0.05378	6.4252	22	0.953	7.98E-03
6	42.7	20	11.4	127	14838.8	0.05755	6.72441	22	0.953	8.16E-03
7	47.8	20	9.7	127	14134	0.06764	7.52756	22	0.953	8.56E-03
									AVG	8.37E-03

Note:

Tested by: _____ Checked by: TK
Rowdy Miller Trevor Kauffeld

Electronic Filing: Received, Clerk's Office 10/31/2022

MEASUREMENT OF HYDRAULIC CONDUCTIVITY OF SATURATED POROUS MATERIALS
USING A FLEXIBLE WALL PERMEAMETER
ASTM D 5084 - 03 METHOD C TEST WITH INCREASING TAILWATER LEVEL
FLUID: DEAIRED TAP WATER WITH 0.005 N CaSO4

PROJECT: KPRG LABORATORY TESTING — TERRACON JOB #: 58055075 — DATE: 10/7/2005

SAMPLE ID: PS-GT-7 10.0'-13.0' — #4 MATERIAL

DESCR.: SAND WITH SILT and GRAVEL (SW-SM), DARK GRAY

Durham Perm Cell — BURETTE Area 0.317 cm^2

INITIAL

MOISTURE%		DENSITY			
W & T, g	88.50	WET WT, g	191.6		
D & T, g	83.87	DIA, in	1.94	4.93	cm
T, g	19.37	HT, in	1.96	4.98	cm
		AREA		19.05	cm^2
MOIST-		DENSITY:	126.2	PCF WET	
URE, %	7.2	DENSITY:	117.7	PCF DRY	

SPEC GRAV:	2.700	REMOLD (Y/N):	YES
POROSITY, %:	30.1	PROCTOR:	NA
SATURATION, %:	44.9	OPTIMUM:	NA
VOID RATIO:	0.43	COMPACTION, %:	#VALUE!
		OVER OPTIMUM, %:	#VALUE!

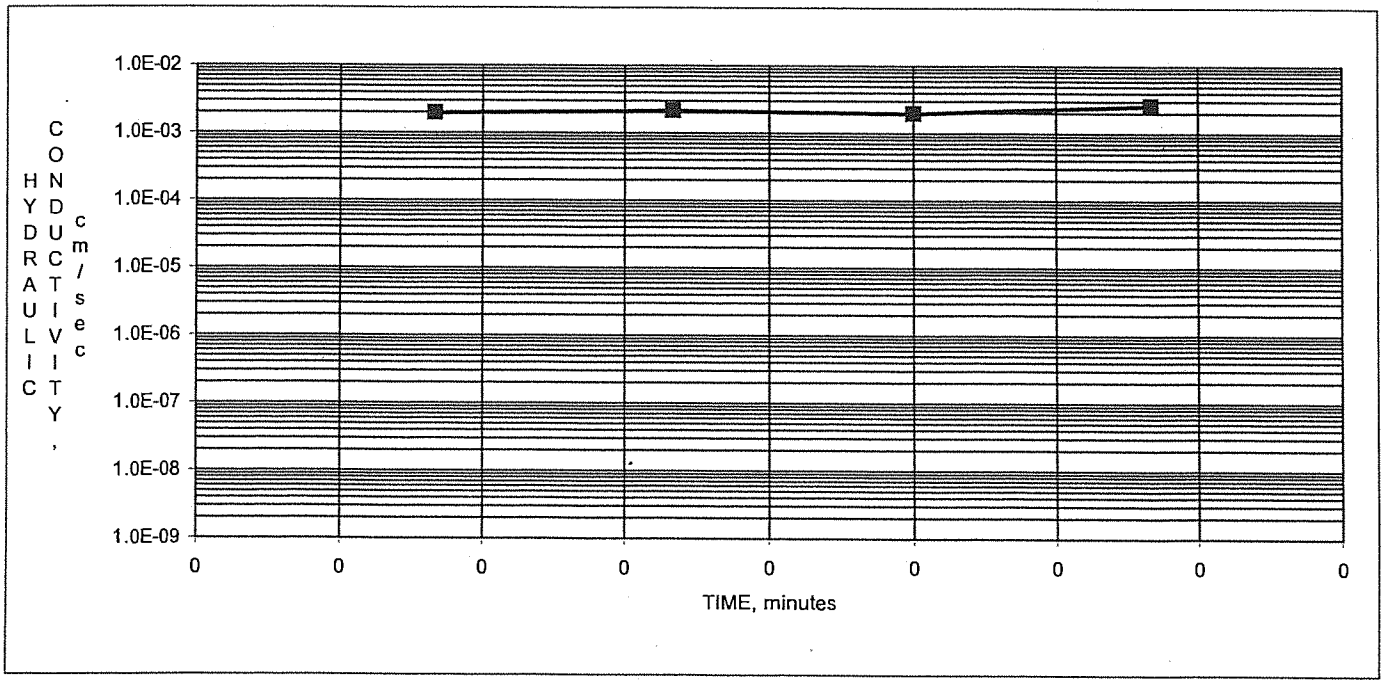
SATURATION:	LATERAL PRESS.:	105.0	psi	BACK PRESSURE (=UPPER=LOWER):	100.0 psi
TEST:	LATERAL PRESS.:	105.0	psi	UPPER: 100.0 psi	LOWER: 100.0 psi
				BIAS PRESSURE (=LOWER-UPPER)	0.0 psi

Upper cm^3	Lower cm^3	ELAPSED TIME, min	DELTA H cm	Ln H1/H2	HYD CON k, cm/sec	OUT FLOW cm^3	IN FLOW cm^3	OUT/IN RATIO	HYD GRAD	% FROM MEAN k	TEMP.: C	TEMP. CORR.:
20.8	30.1	0	9.3									
21.8	29.1	0	7.3	0.242140	1.96E-03	1.0	1.0	1.00	1.5	9	21	0.980
22.6	28.2	0	5.6	0.265108	2.15E-03	0.8	0.9	0.89	1.1	1	21	0.980
23.2	27.6	0	4.4	0.241162	1.96E-03	0.6	0.6	1.00	0.9	10	21	0.980
23.8	27.0	0	3.2	0.318454	2.58E-03	0.6	0.6	1.00	0.6	19	21	0.980

HYDRAULIC CONDUCTIVITY (k) = AVERAGE 2.2E-03 cm/sec

MAXIMUM HYDRAULIC GRADIENT			
1.0E-03 TO 1.0E-04	2	0.75< RATIO <1.25	% < 25 AT > 1.0E-8 OR % < 50 AT < 1.0E-8
1.0E-04 TO 1.0E-05	5		
1.0E-05 TO 1.0E-06	10		
1.0E-06 TO 1.0E-07	20		
1.0E-07 TO 1.0E-10	30		

NUMBER OF PORE VOLUMES PASSED = 0.0333



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PERMEABILITY TEST ON GRANULAR SOIL
ASTM D 2434

Project Number 58055075 Project Name KPRG Laboratory Testing

Test Number _____ Date 9/18/2005

Location of Sample PS-GT-8 Sampled _____ Report _____

Boring- _____ Sample- Bottom Depth- 10 to 15'

Description of Soil Silty Sand, trace clay, dark gray

Materials Used: _____

Unit Weight Determination:

Diameter, D, cm 7.62 Wt. Soil (lb.) 1.320

Area, A, cm^2 45.60 Moisture Content 12.0

Length, L, cm 6.350000 Volume (ft^3) 0.01022

Dry Density 115.3

Degree of Compactness Unknown- No proctor available

Test No.	Head,h(cm)	Q (cm^3)	t (s)	QL	Ath	Velocity (Q/At)	Hyd. Grad. (h/L)	Temp, C.	Temp. Corr.	k (cm/s)
1	3.3	20	31.5	127	4740.5	0.01392	0.51969	20	1.000	2.68E-02
2	8.7	20	14	127	5554.52	0.03133	1.37008	20	1.000	2.29E-02
3	13.5	20	9.2	127	5663.97	0.04767	2.12598	20	1.000	2.24E-02
4	17.2	20	7	127	5490.68	0.06265	2.70866	20	1.000	2.31E-02
5	21.5	20	5.5	127	5392.63	0.07974	3.38583	20	1.000	2.36E-02
6	24.3	20	5	127	5540.84	0.08771	3.82677	20	1.000	2.29E-02
7	32.3	20	4	127	5891.99	0.10964	5.08661	20	1.000	2.16E-02
8	32.3	20	4	127	5891.99	0.10964	5.08661	20	1.000	2.16E-02
9									AVG	2.31E-02
10										
11										
12										

Note:

Tested by: Rowdy Miller Checked by: TK Trevor Kauffeld

Electronic Filing: Received, Clerk's Office 10/31/2022

MEASUREMENT OF HYDRAULIC CONDUCTIVITY OF SATURATED POROUS MATERIALS
USING A FLEXIBLE WALL PERMEAMETER
ASTM D 5084 - 03 METHOD C TEST WITH INCREASING TAILWATER LEVEL
FLUID: DEAIRED TAP WATER WITH 0.005 N CaSO4

PROJECT: KPRG LABORATORY TESTING — TERRACON JOB #: 58055075 — DATE: 10/7/2005

SAMPLE ID: PS-GT-9 15.0'-20.0' — #4 MATERIAL

DESCR.: SAND WITH GRAVEL & SILT, DARK YELLOWISH BROWN

Durham Perm Cell — BURETTE Area 0.317 cm^2

INITIAL

MOISTURE%		DENSITY			
W & T, g	51.97	WET WT, g	183.1		
D & T, g	50.15	DIA, in	1.94	4.94	cm
T, g	20.20	HT, in	1.95	4.96	cm
		AREA		19.15	cm^2
MOIST-		DENSITY:	120.3	PCF WET	
URE, %	6.1	DENSITY:	113.4	PCF DRY	

SPEC GRAV:	2.700	REMOLD (Y/N):	YES
POROSITY, %:	32.7	PROCTOR:	NA
SATURATION, %:	33.7	OPTIMUM:	NA
VOID RATIO:	0.49	COMPACTION, %:	#VALUE!
		OVER OPTIMUM, %:	#VALUE!

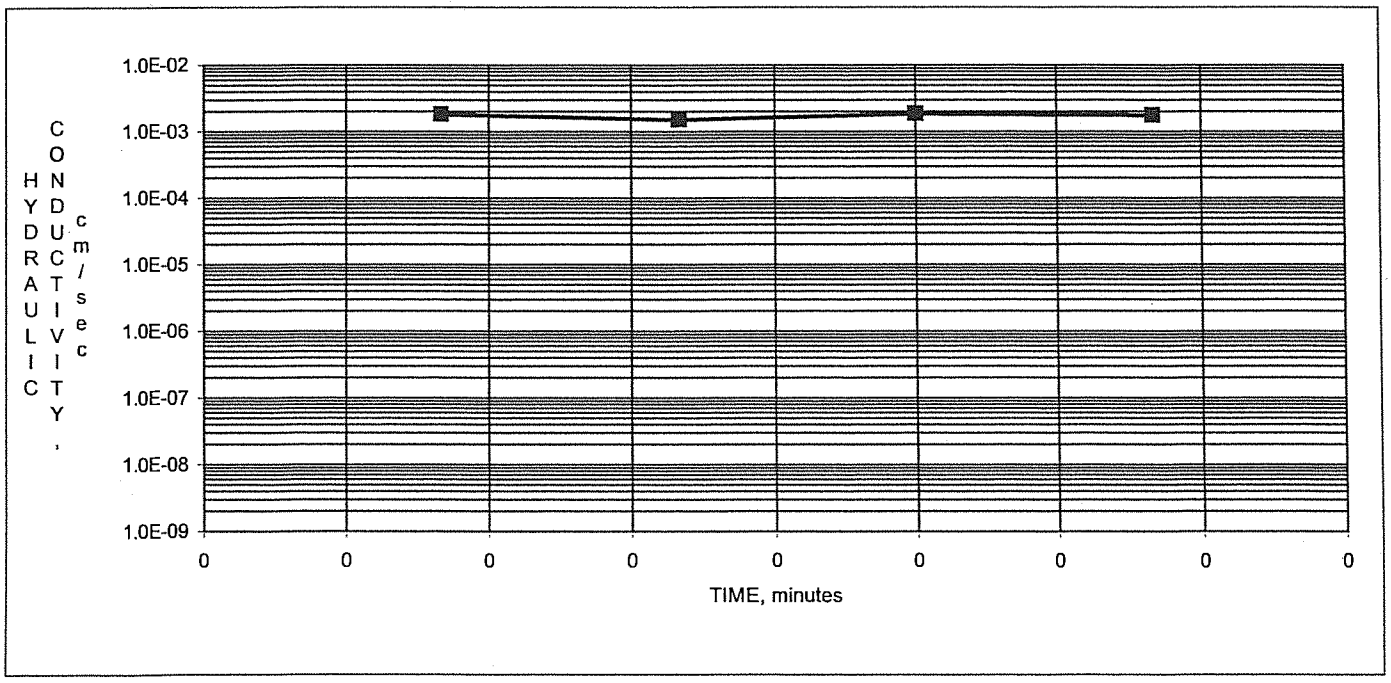
SATURATION:	LATERAL PRESS.:	105.0	psi	BACK PRESSURE (=UPPER=LOWER):	100.0 psi
TEST:	LATERAL PRESS.:	105.0	psi	UPPER: 100.0 psi	LOWER: 100.0 psi
				BIAS PRESSURE (=LOWER-UPPER)	0.0 psi

Upper cm^3	Lower cm^3	ELAPSED TIME, min	DELTA H cm	Ln H1/H2	HYD CON k, cm/sec	OUT FLOW cm^3	IN FLOW cm^3	OUT/IN RATIO	HYD GRAD	% FROM MEAN k	TEMP.: C	TEMP. CORR.:
10.5	16.3	0	5.8									
11.1	15.7	0	4.6	0.231802	1.82E-03	0.6	0.6	1.00	0.9	5	22	0.956
11.5	15.3	0	3.8	0.191055	1.50E-03	0.4	0.4	1.00	0.8	13	22	0.956
11.9	14.9	0	3.0	0.236389	1.85E-03	0.4	0.4	1.00	0.6	7	22	0.956
12.2	14.6	0	2.4	0.223144	1.75E-03	0.3	0.3	1.00	0.5	1	22	0.956

HYDRAULIC CONDUCTIVITY (k) = **AVERAGE 1.7E-03 cm/sec**

MAXIMUM	1.0E-03 TO 1.0E-04	2	0.75<	% < 25 AT
HYDRAULIC	1.0E-04 TO 1.0E-05	5	RATIO	> 1.0E-8
GRADIENT	1.0E-05 TO 1.0E-06	10	<1.25	OR
	1.0E-06 TO 1.0E-07	20		% < 50 AT
	1.0E-07 TO 1.0E-10	30		< 1.0E-8

NUMBER OF PORE VOLUMES PASSED = 0.0173



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PERMEABILITY TEST ON GRANULAR SOIL
ASTM D 2434

Project Number 58055075 Project Name KPRG Laboratory Testing

Test Number _____ Date 9/16/2005

Location of Sample JS-29-GT-1 Sampled _____ Report _____

Boring- _____ Sample- _____ Depth- 19 to 24'

Description of Soil Sand, fine grained, trace clay and gravel, dark yellow

Materials Used: _____

Unit Weight Determination:

Diameter, D, cm 7.58 Wt. Soil (lb.) 1.290

Area, A, cm^2 45.13 Moisture Content 5.3

Length, L, cm 6.350000 Volume (ft^3) 0.01022

Dry Density 119.9

Degree of Compactness Unknown- No proctor available

Test No.	Head,h(cm)	Q (cm^3)	t (s)	QL	Ath	Velocity (Q/At)	Hyd. Grad. (h/L)	Temp, C.	Temp. Corr.	k (cm/s)
1	2.5	20	31.5	127	3553.68	0.01407	0.3937	20	1.000	3.57E-02
2	7.1	20	14	127	4485.54	0.03166	1.11811	20	1.000	2.83E-02
3	11.2	20	9.5	127	4801.42	0.04665	1.76378	20	1.000	2.65E-02
4	14	20	7	127	4422.36	0.06331	2.20472	20	1.000	2.87E-02
5	17.6	20	5.5	127	4368.21	0.08058	2.77165	20	1.000	2.91E-02
6	18.8	20	5	127	4241.85	0.08864	2.96063	20	1.000	2.99E-02
7	24	20	4	127	4332.11	0.1108	3.77953	20	1.000	2.93E-02
8	24	20	4	127	4332.11	0.1108	3.77953	20	1.000	2.93E-02
9									AVG	2.96E-02
10										
11										
12										

Note:

Tested by: Rowdy Miller Checked by: TK Trevor Kauffeld

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PERMEABILITY TEST ON GRANULAR SOIL
ASTM D 2434

Project Number 58055075 Project Name KPRG Laboratory Testing

Test Number _____ Date 9/12/2005

Location of Sample JS-9-GT-2 Sampled _____ Report _____

Boring- _____ Sample- _____ Depth- 7 to 11.5'

Description of Soil Clayey Sand, with organics, trace gravel, dark brown

Materials Used: _____

Unit Weight Determination:

Diameter, D, cm 7.62 Wt. Soil (lb.) 1.150

Area, A, cm^2 45.60 Moisture Content 23.7

Length, L, cm 6.350000 Volume (ft^3) 0.01022

Dry Density 91.0

Degree of Compactness Unknown- No proctor available

Test No.	Head,h(cm)	Q (cm^3)	t (s)	QL	Ath	Velocity (Q/At)	Hyd. Grad. (h/L)	Temp, C.	Temp. Corr.	k (cm/s)
1	3	20	31.5	127	4309.54	0.01392	0.47244	20	1.000	2.95E-02
2	7.1	20	14	127	4533	0.03133	1.11811	20	1.000	2.80E-02
3	11.9	20	9.5	127	5155.49	0.04616	1.87402	20	1.000	2.46E-02
4	13.3	20	7	127	4245.7	0.06265	2.09449	20	1.000	2.99E-02
5	18.2	20	5.5	127	4564.92	0.07974	2.86614	20	1.000	2.78E-02
6	20.8	20	5	127	4742.78	0.08771	3.27559	20	1.000	2.68E-02
7	27	20	4	127	4925.19	0.10964	4.25197	20	1.000	2.58E-02
8	27	20	4	127	4925.19	0.10964	4.25197	20	1.000	2.58E-02
9									AVG	2.73E-02
10										
11										
12										

Note:

Tested by: _____ Checked by: TK

Rowdy Miller Trevor Kauffeld

Electronic Filing: Received, Clerk's Office 10/31/2022

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PERMEABILITY TEST ON GRANULAR SOIL
ASTM D 2434

Project Number 58055075 Project Name KPRG Laboratory Testing

Test Number _____ Date 9/15/2005

Location of Sample JS-29-GT-3 Sampled _____ Report _____

Boring- _____ Sample- Bottom Depth- 19 to 24'

Description of Soil Sand, with gravel, trace clay, brown

Materials Used: _____

Unit Weight Determination:

Diameter, D, cm 7.59 Wt. Soil (lb.) 1.340

Area, A, cm^2 45.25 Moisture Content 8.6

Length, L, cm 6.350000 Volume (ft^3) 0.01022

Dry Density 120.7

Degree of Compactness Unknown- No proctor available

Test No.	Head,h(cm)	Q (cm^3)	t (s)	QL	Ath	Velocity (Q/At)	Hyd. Grad. (h/L)	Temp, C.	Temp. Corr.	k (cm/s)
1	2.9	20	31.5	127	4133.15	0.01403	0.45669	20	1.000	3.07E-02
2	7.3	20	14	127	4624.07	0.03157	1.14961	20	1.000	2.75E-02
3	11.3	20	9.5	127	4857.08	0.04653	1.77953	20	1.000	2.61E-02
4	16.4	20	7	127	5194.16	0.06315	2.58268	20	1.000	2.45E-02
5	21.7	20	5.5	127	5400.02	0.08037	3.41732	20	1.000	2.35E-02
6	23.9	20	5	127	5406.81	0.08841	3.76378	20	1.000	2.35E-02
7	31	20	4	127	5610.41	0.11051	4.88189	20	1.000	2.26E-02
8	31	20	4	127	5610.41	0.11051	4.88189	20	1.000	2.26E-02
9									AVG	2.51E-02
10										
11										
12										

Note:

Tested by: Rowdy Miller Checked by: TK Trevor Kauffeld

Electronic Filing: Received, Clerk's Office 10/31/2022

MEASUREMENT OF HYDRAULIC CONDUCTIVITY OF SATURATED POROUS MATERIALS
USING A FLEXIBLE WALL PERMEAMETER
ASTM D 5084 - 03 METHOD C TEST WITH INCREASING TAILWATER LEVEL
FLUID: DEAIRED TAP WATER WITH 0.005 N CaSO4

PROJECT: KPRG LABORATORY TESTING TERRACON JOB #: 58055075
DATE: 10/7/2005

SAMPLE ID: JS 29-GT-5 5.0' - 9.0' Top 8" #4 MATERIAL
DESCR.: CLAYEY GRAVEL WITH SAND (GC), DARK GRAY WITH YELLOWISH BROWN

Durham Perm Cell
BURETTE Area 0.317 cm^2

INITIAL					
MOISTURE%		DENSITY			
W & T, g	48.02	WET WT, g	172.0		
D & T, g	44.14	DIA, in	1.94	4.93	cm
T, g	20.33	HT, in	1.96	4.98	cm
		AREA		19.05	cm^2
MOIST-		DENSITY:	113.3	PCF WET	
URE, %	**16.3**	DENSITY:	**97.4**	PCF DRY	

SPEC GRAV:	2.700	REMOLD (Y/N):	YES
POROSITY, %:	42.2	PROCTOR:	NA
SATURATION, %:	60.2	OPTIMUM:	NA
VOID RATIO:	0.73	COMPACTION, %:	#VALUE!
		OVER OPTIMUM, %:	#VALUE!

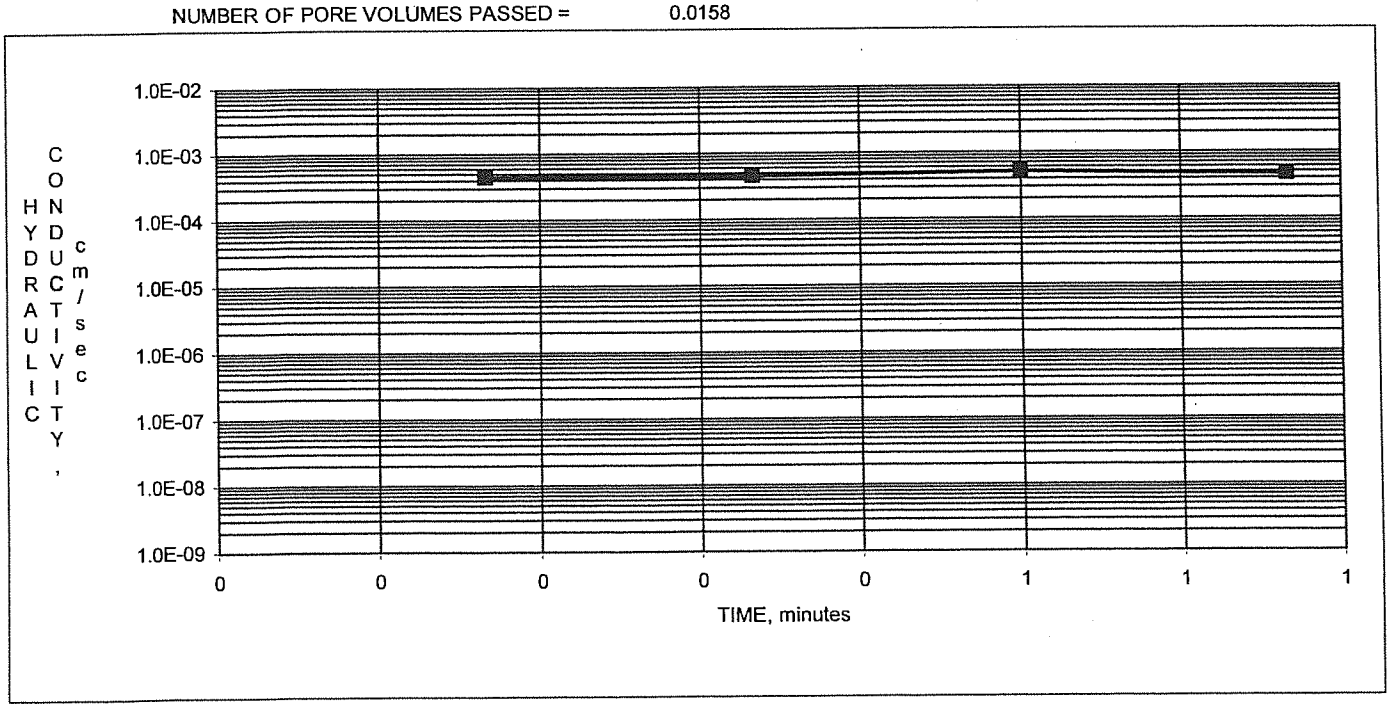
SATURATION:	LATERAL PRESS.:	105.0	psi	BACK PRESSURE (=UPPER=LOWER):	100.0 psi
TEST:	LATERAL PRESS.:	105.0	psi	UPPER: 100.0 psi	LOWER: 100.0 psi
				BIAS PRESSURE (=LOWER-UPPER)	0.0 psi

Upper cm^3	Lower cm^3	ELAPSED TIME, min	DELTA H cm	Ln H1/H2	HYD CON k, cm/sec	OUT FLOW cm^3	IN FLOW cm^3	OUT/IN RATIO	HYD GRAD	% FROM MEAN k	TEMP.: C	TEMP. CORR.:
10.6	20.9	0	10.3									
11.2	20.4	0	9.2	0.112940	4.47E-04	0.6	0.5	1.20	1.8	5	22	0.956
11.7	19.9	0	8.2	0.115069	4.55E-04	0.5	0.5	1.00	1.6	3	22	0.956
12.2	19.4	1	7.2	0.130053	5.14E-04	0.5	0.5	1.00	1.4	9	22	0.956
12.6	19.0	1	6.4	0.117783	4.66E-04	0.4	0.4	1.00	1.3	1	22	0.956

HYDRAULIC CONDUCTIVITY (k) = **AVERAGE 4.7E-04 cm/sec**

MAXIMUM	1.0E-03 TO 1.0E-04	2	0.75<	% < 25 AT
HYDRAULIC	1.0E-04 TO 1.0E-05	5	RATIO	> 1.0E-8
GRADIENT	1.0E-05 TO 1.0E-06	10	<1.25	OR
	1.0E-06 TO 1.0E-07	20		% < 50 AT
	1.0E-07 TO 1.0E-10	30		< 1.0E-8

NUMBER OF PORE VOLUMES PASSED = 0.0158



Terracon

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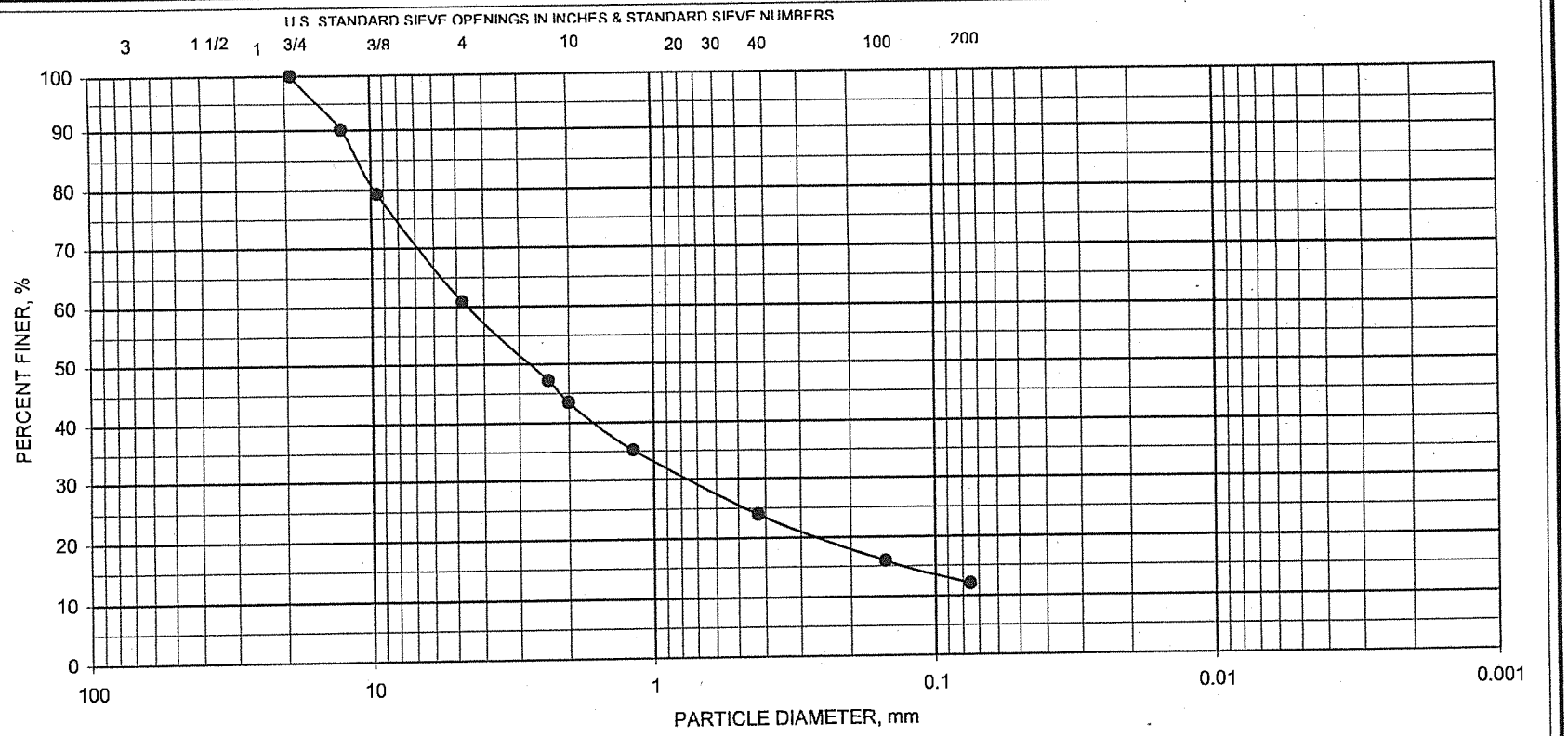


GRAVEL		Sand			Silt or Clay
Coarse	Fine	Coarse	Medium	Fine	

GRAIN SIZE DISTRIBUTION CURVE

BORING NO.	SAMPLE NO.	DEPTH, feet	ASTM DESCRIPTION	UNIFIED SYMBOL	NAT. WC, %	ATTERBERG LIMITS LL	PL	PI
CS-GT-1		5 to 10'	Sand, fine to coarse grained, trace gravel and silt, brown, dark brown, blac	SP				

PROJECT KPRG Laboratory Testing

JOB NO. 58055075 DATE 8/25/2005

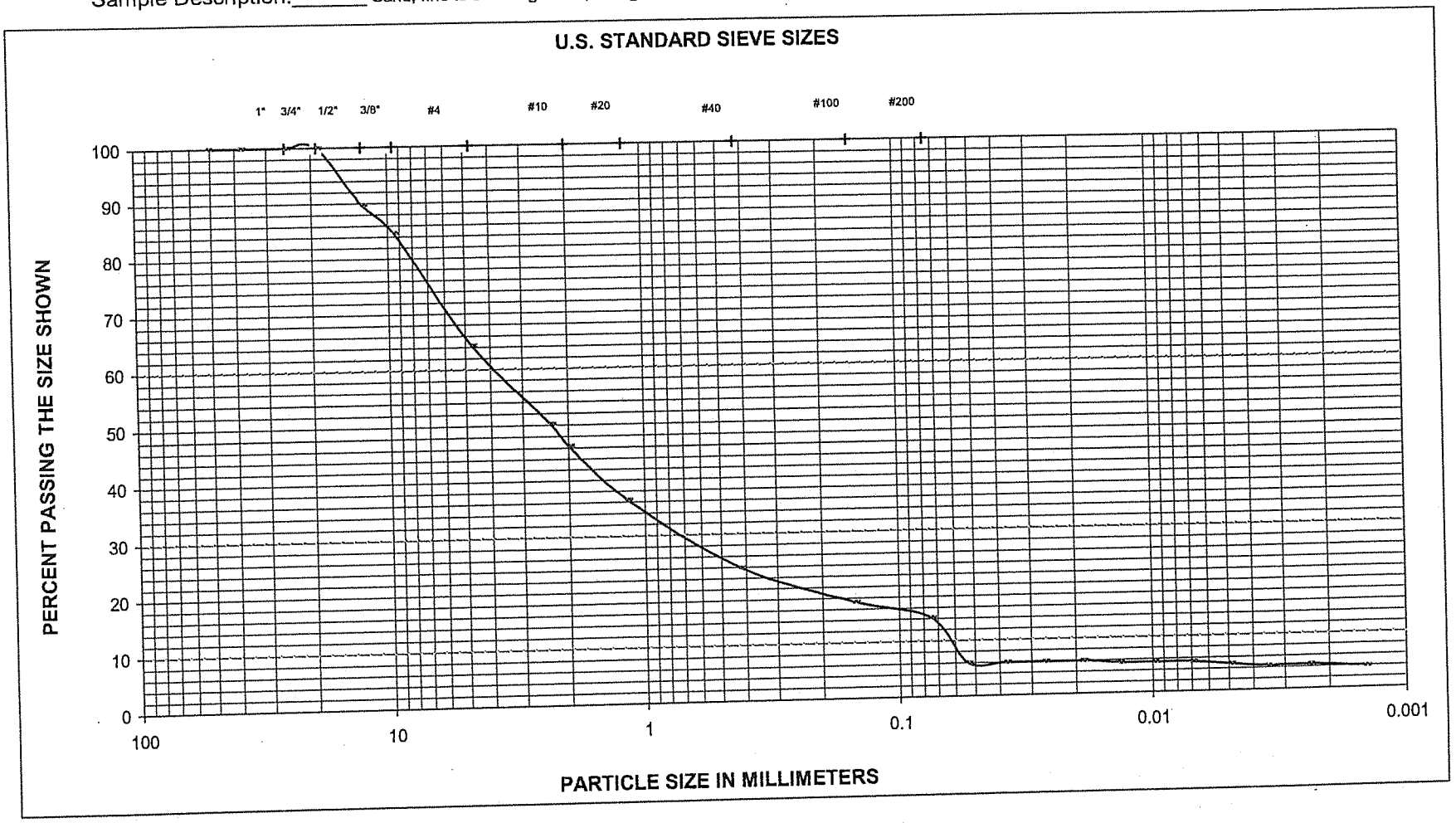
Terracon

Sieve CS-GT-1.xls

Electronic Filing: Received, Clerk's Office 10/31/2022

GRAIN SIZE DISTRIBUTION CURVE

Project Name: KPRG Laboratory Testing
Terracon Project #: 58055075
Boring Number: CS-GT-2
Sample No.: 10-12' (top)
Date: 8/29/2005
Sample type.:
Sample Description: Sand, fine to coarse grained, with gravel, gray (crushed limestone)



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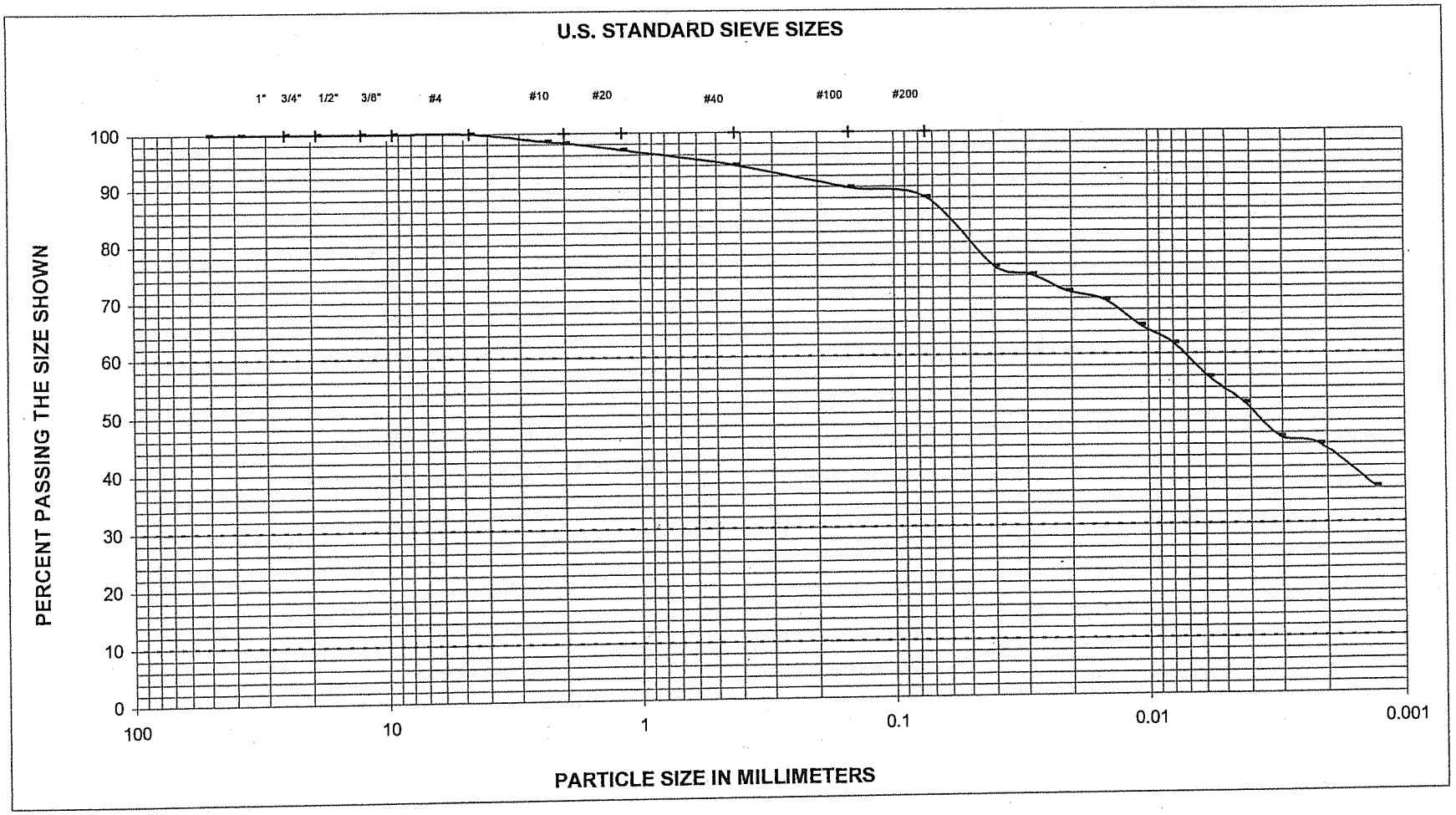
GRAIN SIZE DISTRIBUTION CURVE

Project Name: KPRG Laboratory Testing
Terracon Project #: 58055075
Sample Description: Lean clay, trace sand, gray

Boring Number: CS-GT-2
Sample No.: bottom

Date: 8/29/2005
Sample type.:



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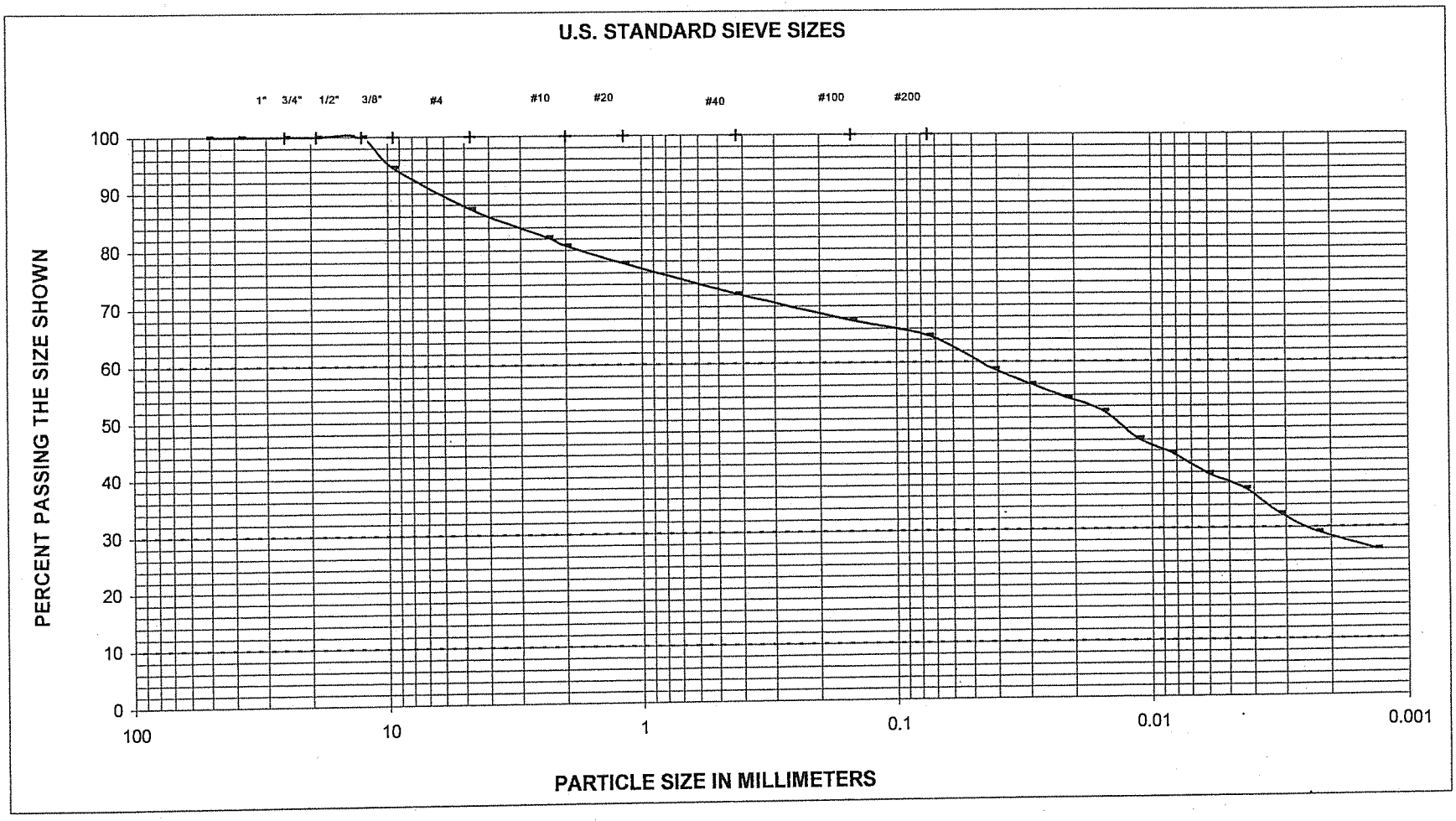
Terracon

GRAIN SIZE DISTRIBUTION CURVE

Project Name: KPRG Laboratory Testing
Terracon Project #: 58055075
Boring Number CS-GT-4
Sample No.:
Date: 8/25/2005
Sample type.:
Sample Description: Lean Clay, Trace Sand and Gravel, Gray



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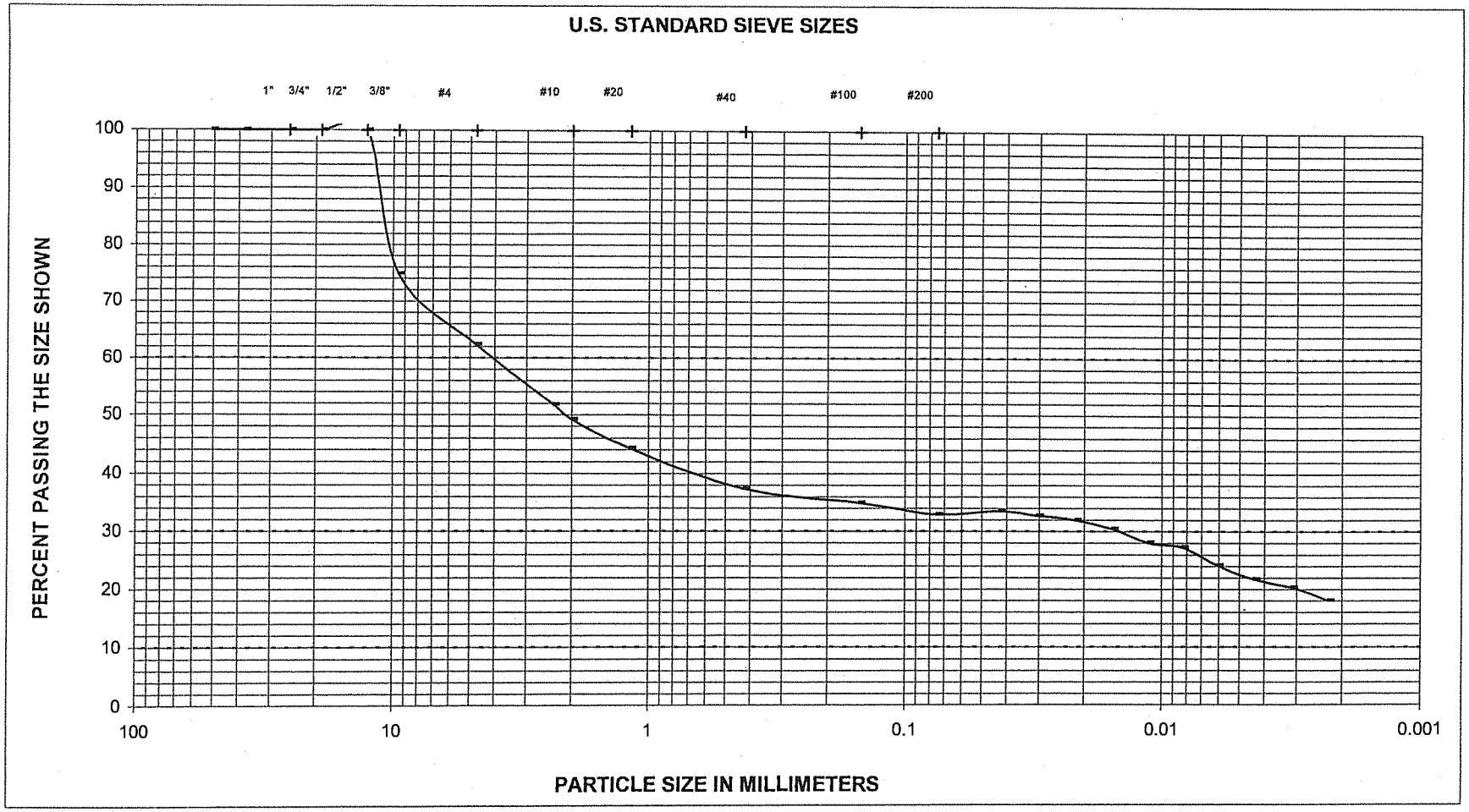
GRAIN SIZE DISTRIBUTION CURVE

Project Name: KPRG Laboratory Testing | Boring Number CS-GT-5 | Date: 8/25/2005

Terracon Project #: 58055075 | Sample No.: | Sample type.:

Sample Description: Silty clay, with sand, brown and gray



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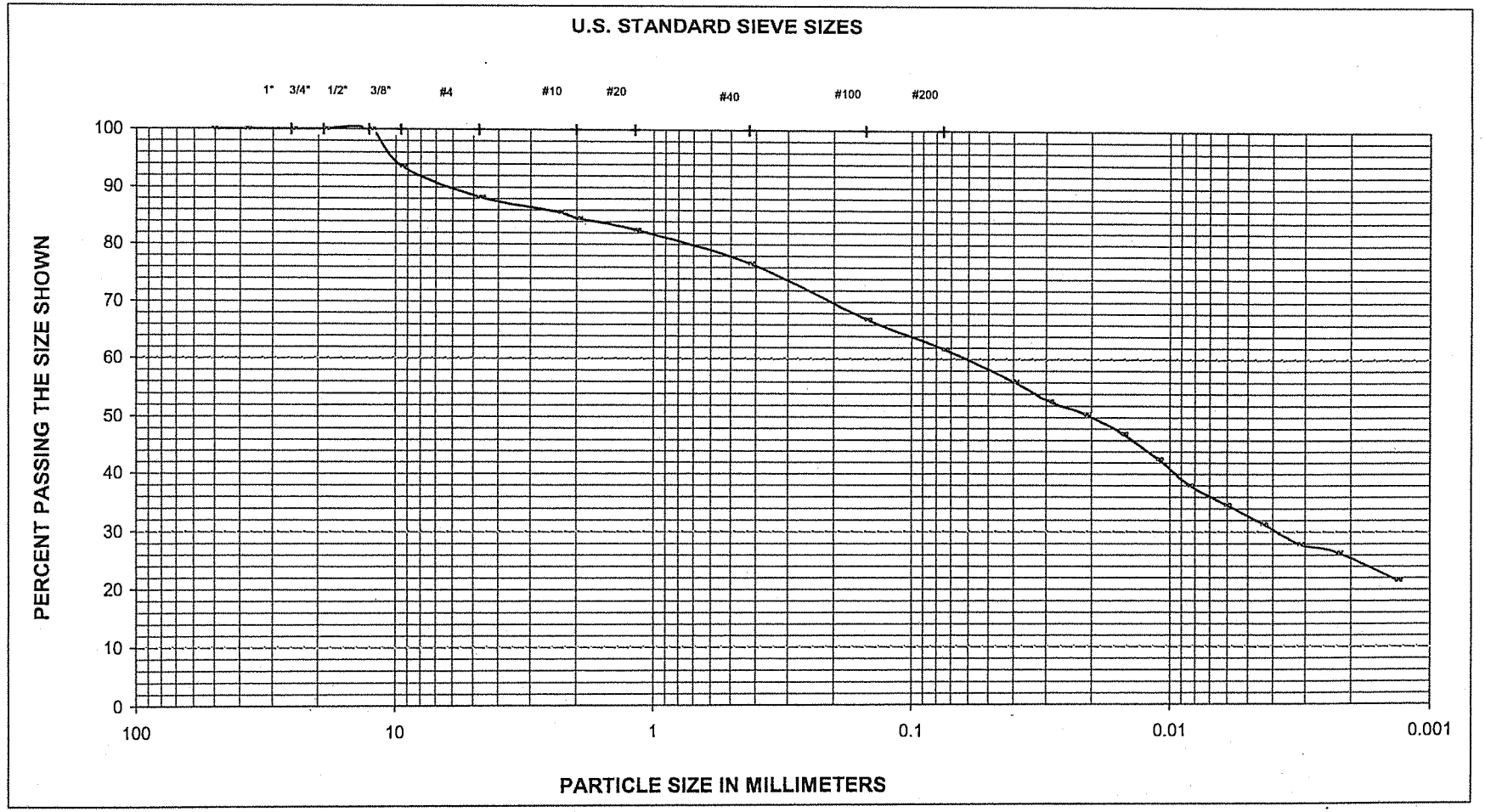
GRAIN SIZE DISTRIBUTION CURVE

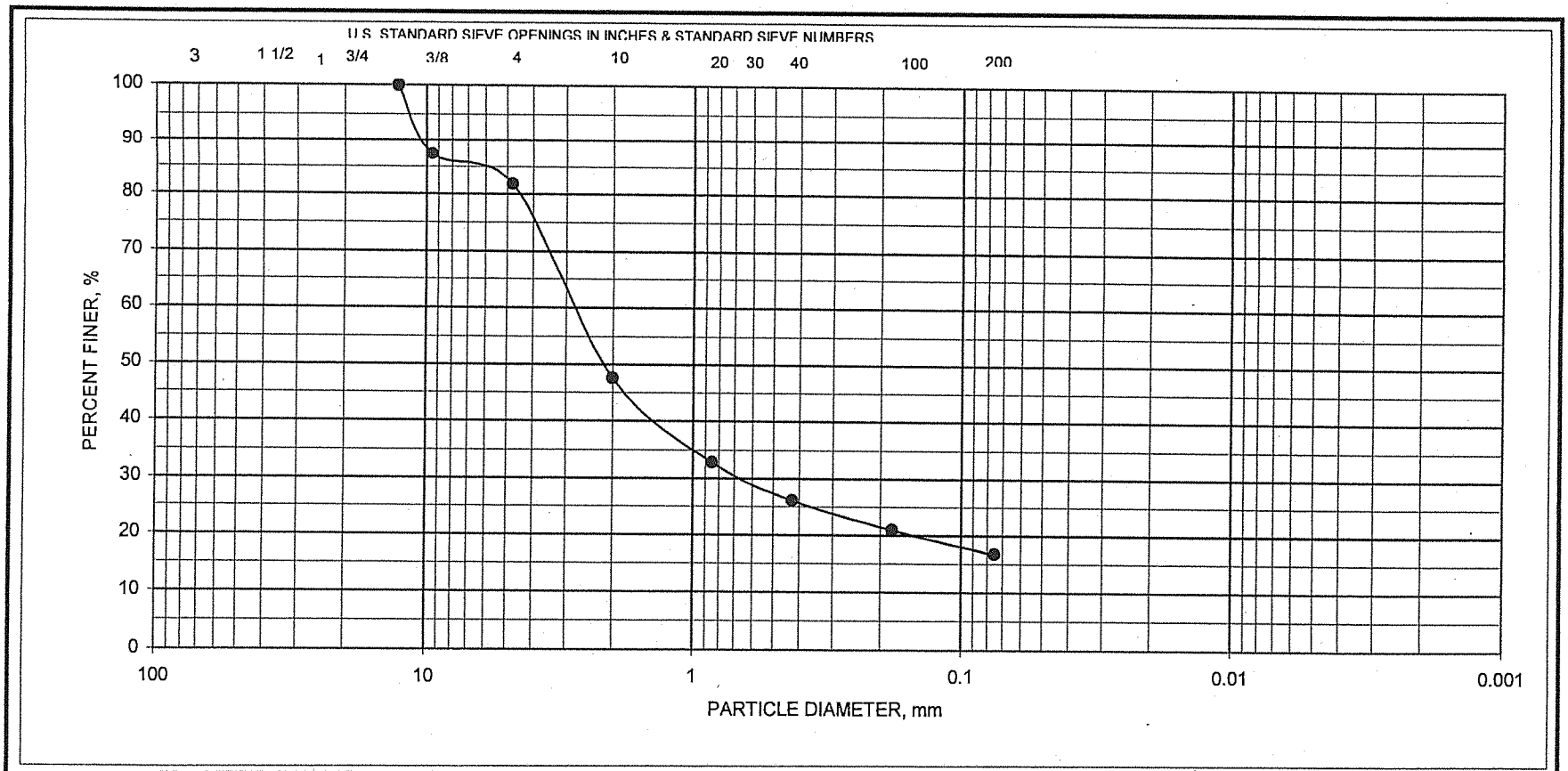
Project Name: KPRG Labarotory Testing Boring Number CS-GT-6 Date: 8/29/2005

Terracon Project #: 58055075 Sample No.: Sample type.:

Sample Description: Sandy Lean Clay, with gravel, brown and dark brown



Electronic Filing: Received, Clerk's Office 10/31/2022



GRAVEL		Sand			Silt or Clay
Coarse	Fine	Coarse	Medium	Fine	

GRAIN SIZE DISTRIBUTION CURVE

BORING NO.	SAMPLE NO.	DEPTH, feet	ASTM DESCRIPTION	UNIFIED SYMBOL	NAT. WC, %	ATTERBERG LIMITS LL	PL	PI
WCGT-1		5 to 10'-Top	Clayey Gravelly Sand	SC				

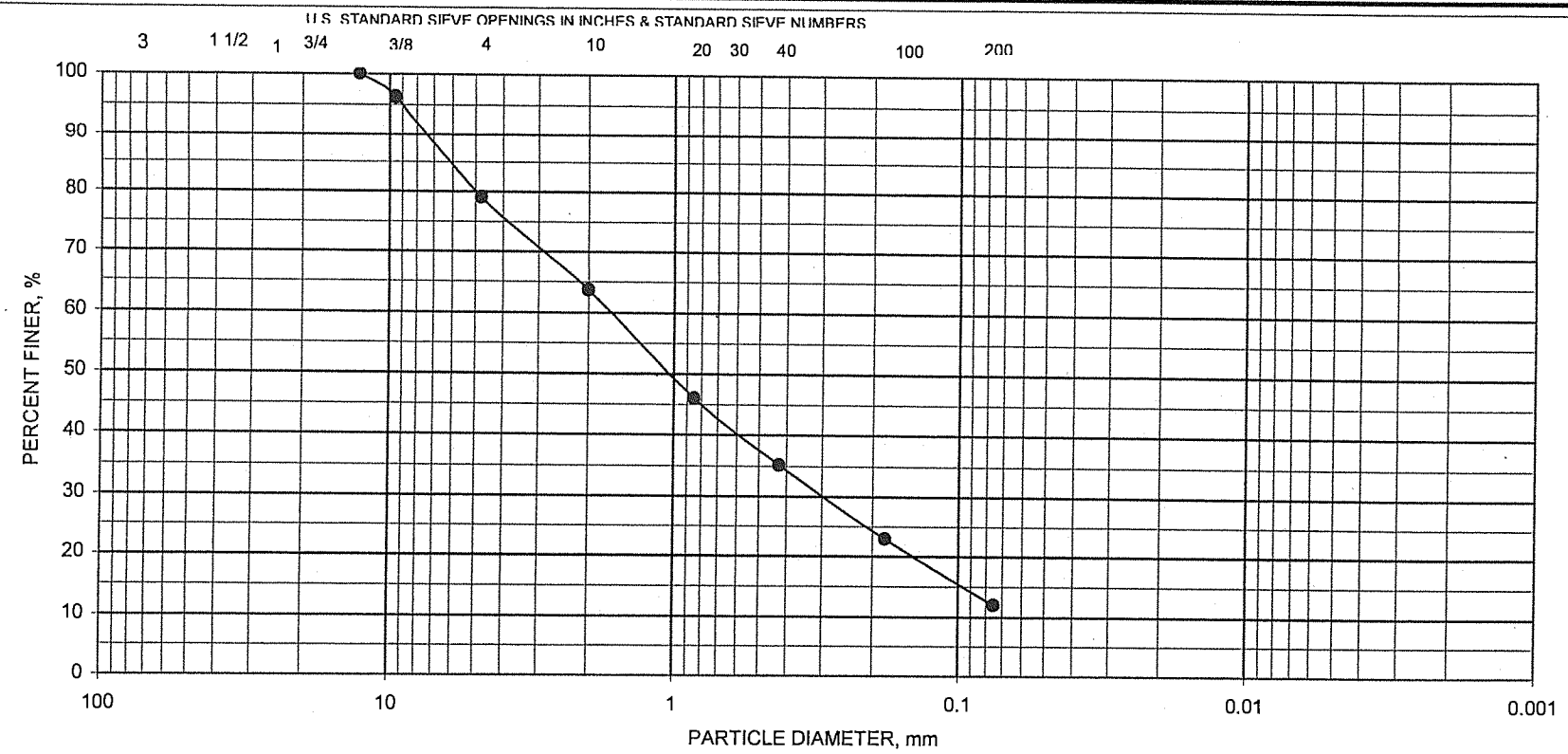
PROJECT KPRG Laboratory Testing

JOB NO. 58055075 DATE 10/1/2005

Terracon

Sieve WCGT-1.xls

Electronic Filing: Received, Clerk's Office 10/31/2022



GRAVEL		Sand			Silt or Clay
Coarse	Fine	Coarse	Medium	Fine	

GRAIN SIZE DISTRIBUTION CURVE

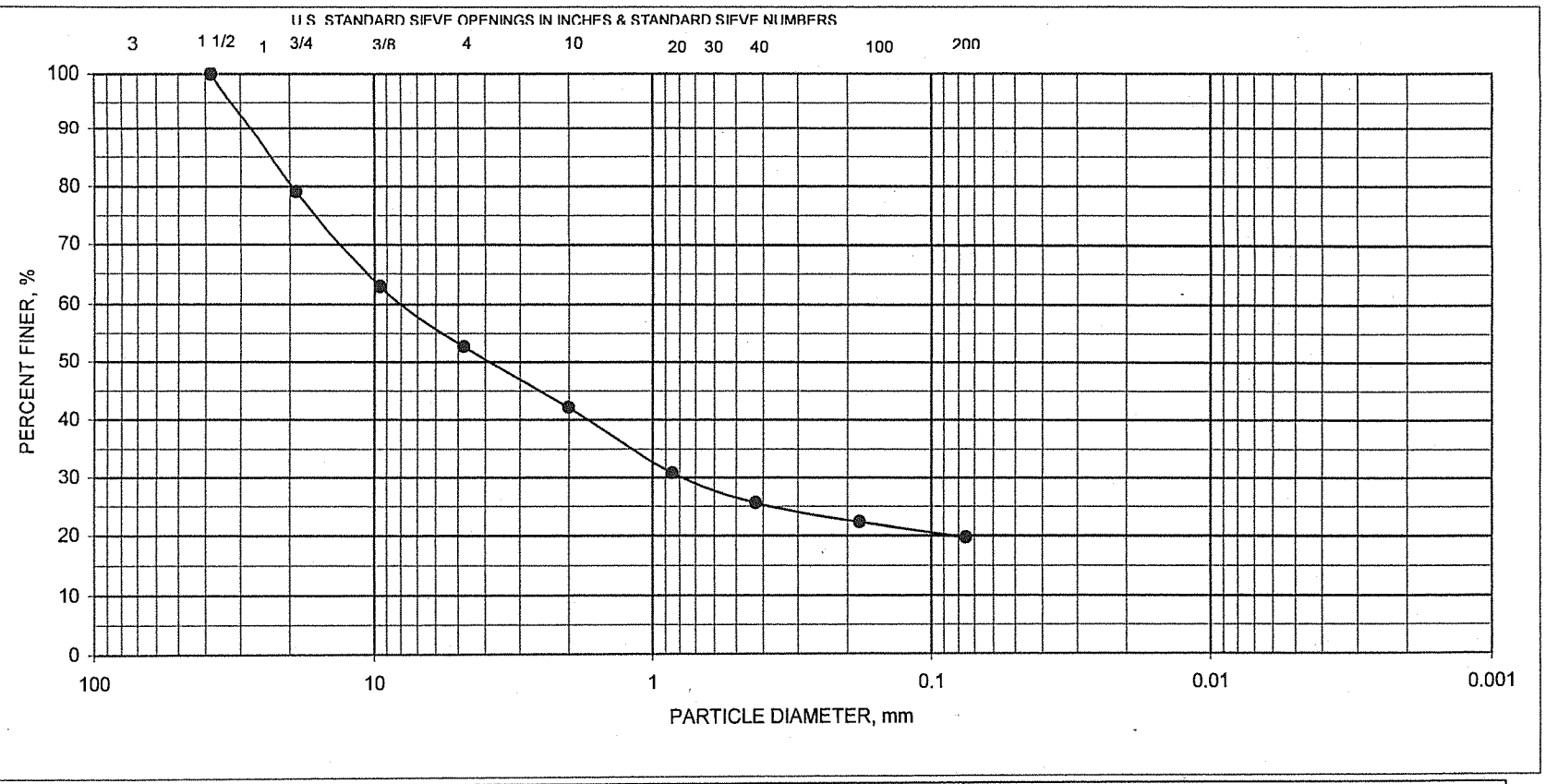
BORING NO.	SAMPLE NO.	DEPTH, feet	ASTM DESCRIPTION	UNIFIED SYMBOL	NAT. WC, %	ATTERBERG LIMITS LL	PL	PI
WCGT-2		5 to 10' BTM	VeryDark Brown Fine To Coarse Sand With Gravel, Trace Clay and Glass Slag	SC				

PROJECT KPRG Laboratory Testing

JOB NO. 58055075 DATE 9/30/2005

Terracon

Electronic Filing: Received, Clerk's Office 10/31/2022



GRAVEL		Sand			Silt or Clay
Coarse	Fine	Coarse	Medium	Fine	

GRAIN SIZE DISTRIBUTION CURVE

BORING NO.	SAMPLE NO.	DEPTH, feet	ASTM DESCRIPTION	UNIFIED SYMBOL	NAT. WC, %	ATTERBERG LIMITS LL	PL	PI
WCGT-3		3 to 8' (Top)	Clayey Gravelly Fine To Coarse Sand	SC				

PROJECT KPRG Laboratory Testing

JOB NO. 58055075 DATE 10/4/2005

Terracon

Sieve WCGT-3.xls

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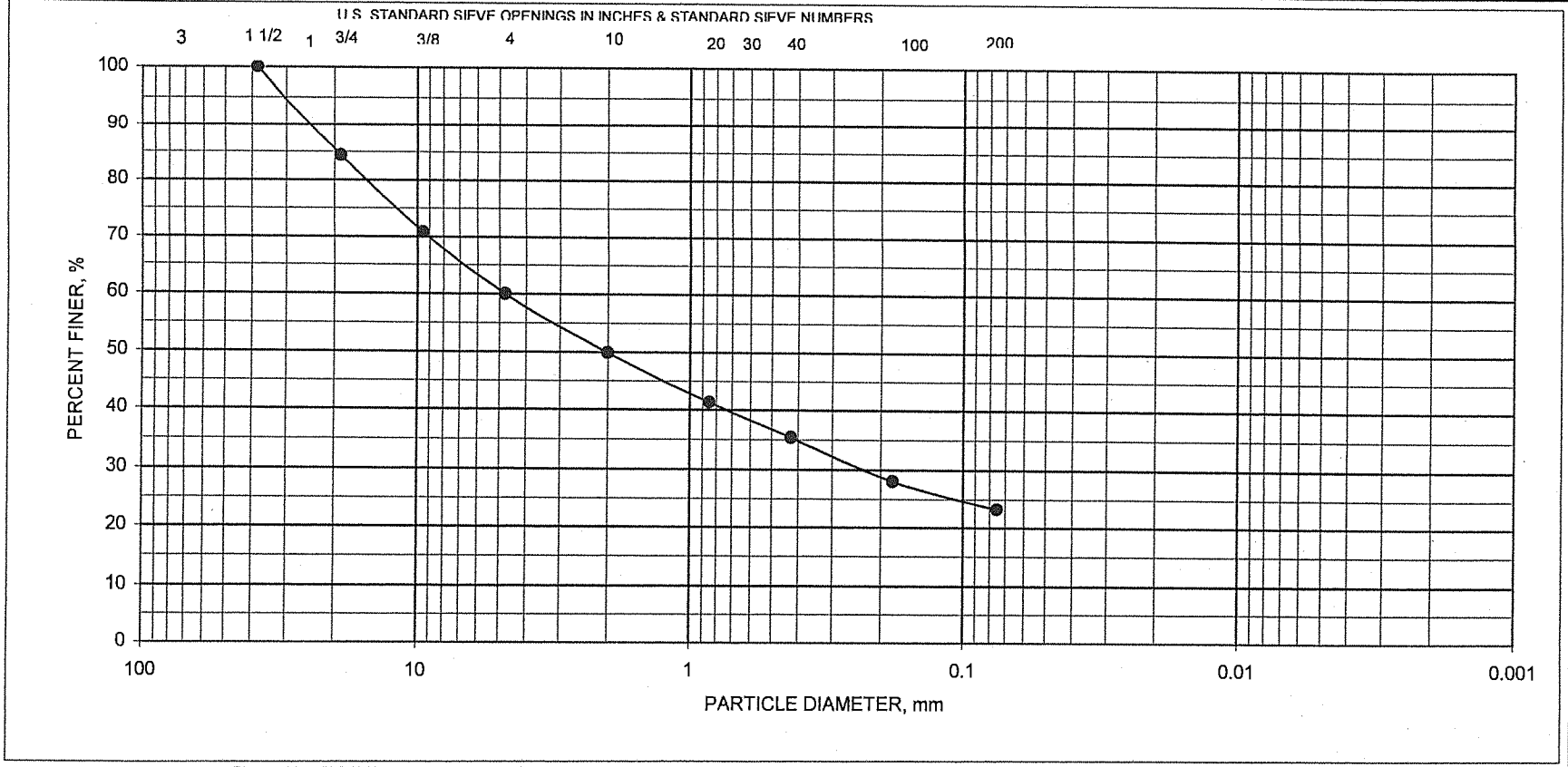

GRAVEL		Sand			Silt or Clay
Coarse	Fine	Coarse	Medium	Fine	

GRAIN SIZE DISTRIBUTION CURVE

BORING NO.	SAMPLE NO.	DEPTH, feet	ASTM DESCRIPTION	UNIFIED SYMBOL	NAT. WC, %	ATTERBERG LIMITS LL	PL	PI
WCGT-4		5 to 10'-Bottom of Sample	Sandy Fine To Coarse Gravel With Clay	GC				

PROJECT KPRG Laboratory Testing

JOB NO. 58055075 DATE 9/24/2005

Terracon

Sieve WCGT-4.xls

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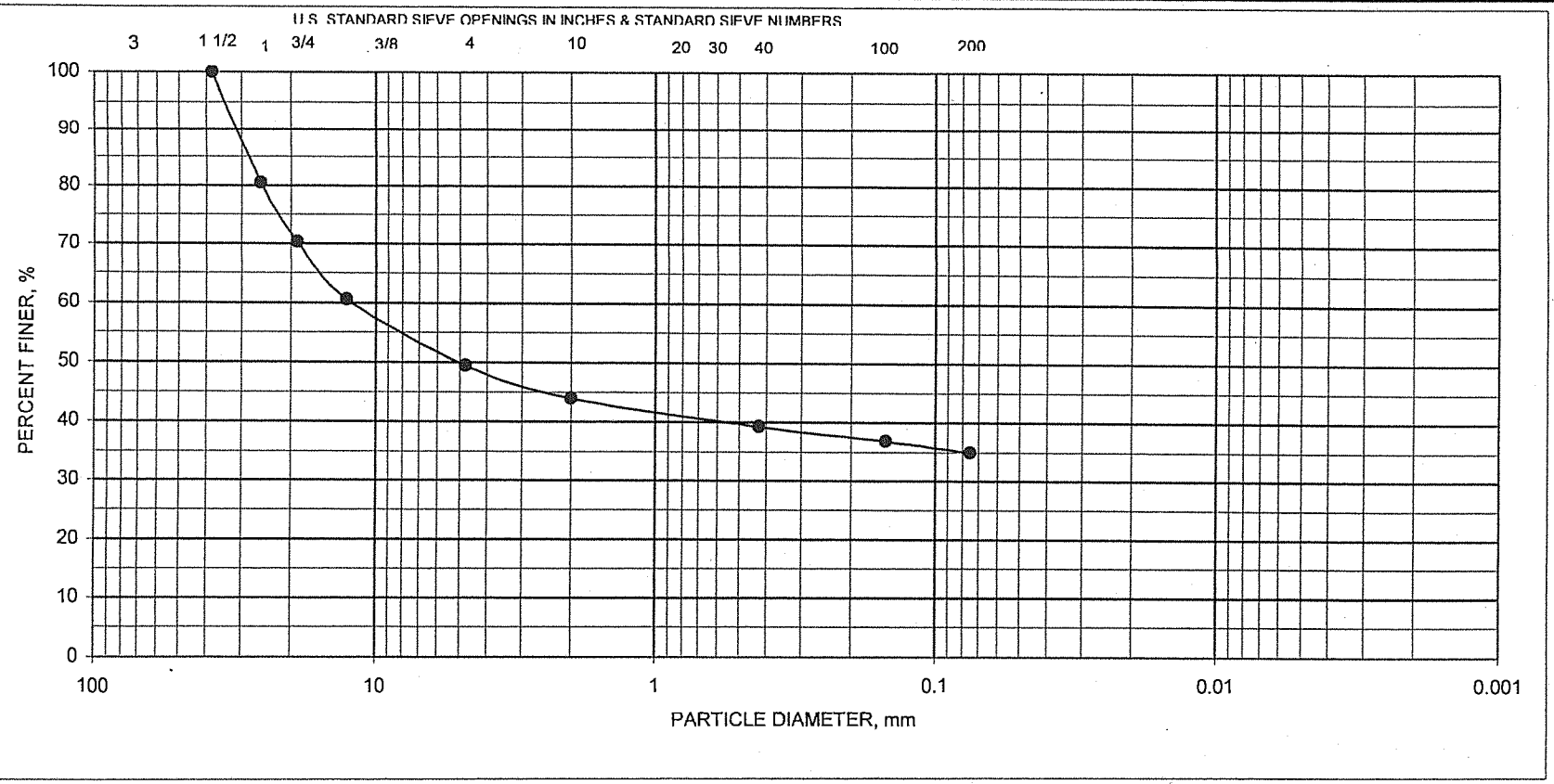


GRAVEL		Sand			Silt or Clay
Coarse	Fine	Coarse	Medium	Fine	

GRAIN SIZE DISTRIBUTION CURVE

BORING NO.	SAMPLE NO.	DEPTH, feet	ASTM DESCRIPTION	UNIFIED SYMBOL	NAT. WC, %	ATTERBERG LIMITS LL	PL	PI
WCGT-5		5 to 9'-Bottom of Sample	Sandy clay with gravel	CL				

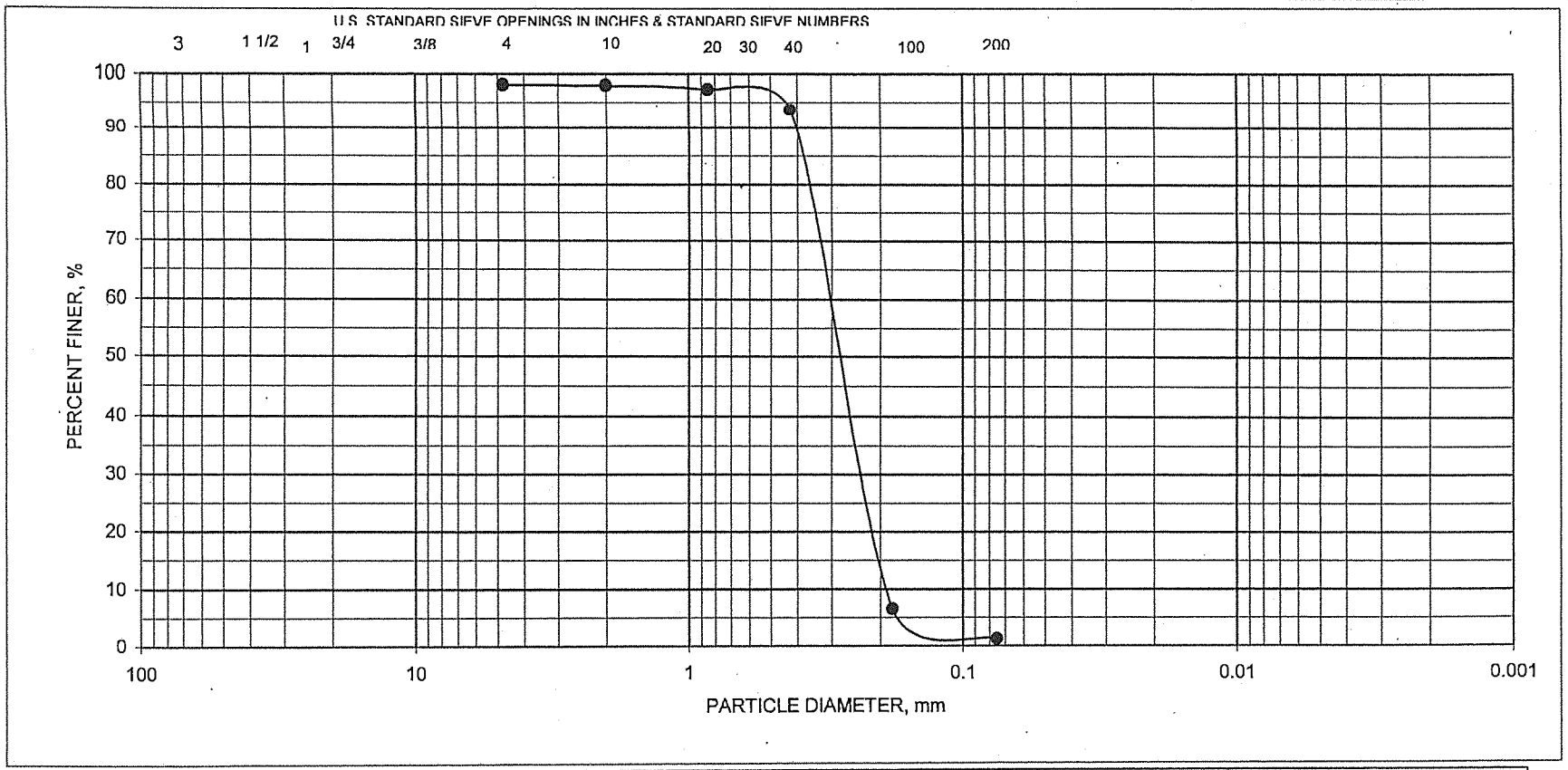
PROJECT KPRG Laboratory Testing

JOB NO. 58055075 DATE 9/29/2005

Terracon

Sieve WCGT-5.xls

Electronic Filing: Received, Clerk's Office 10/31/2022



GRAVEL		Sand			Silt or Clay
Coarse	Fine	Coarse	Medium	Fine	

GRAIN SIZE DISTRIBUTION CURVE

BORING NO.	SAMPLE NO.	DEPTH, feet	ASTM DESCRIPTION	UNIFIED SYMBOL	NAT. WC, %	ATTERBERG LIMITS LL	PL	PI
WSGT-1		5 to 10'	Fine Sand, Trace Gravel & Silt	SP	14	NP	NP	NP

PROJECT KPRG Laboratory Testing

JOB NO. 58055075 DATE 9/21/2005

Terracon

Sieve WSGT-1.xls

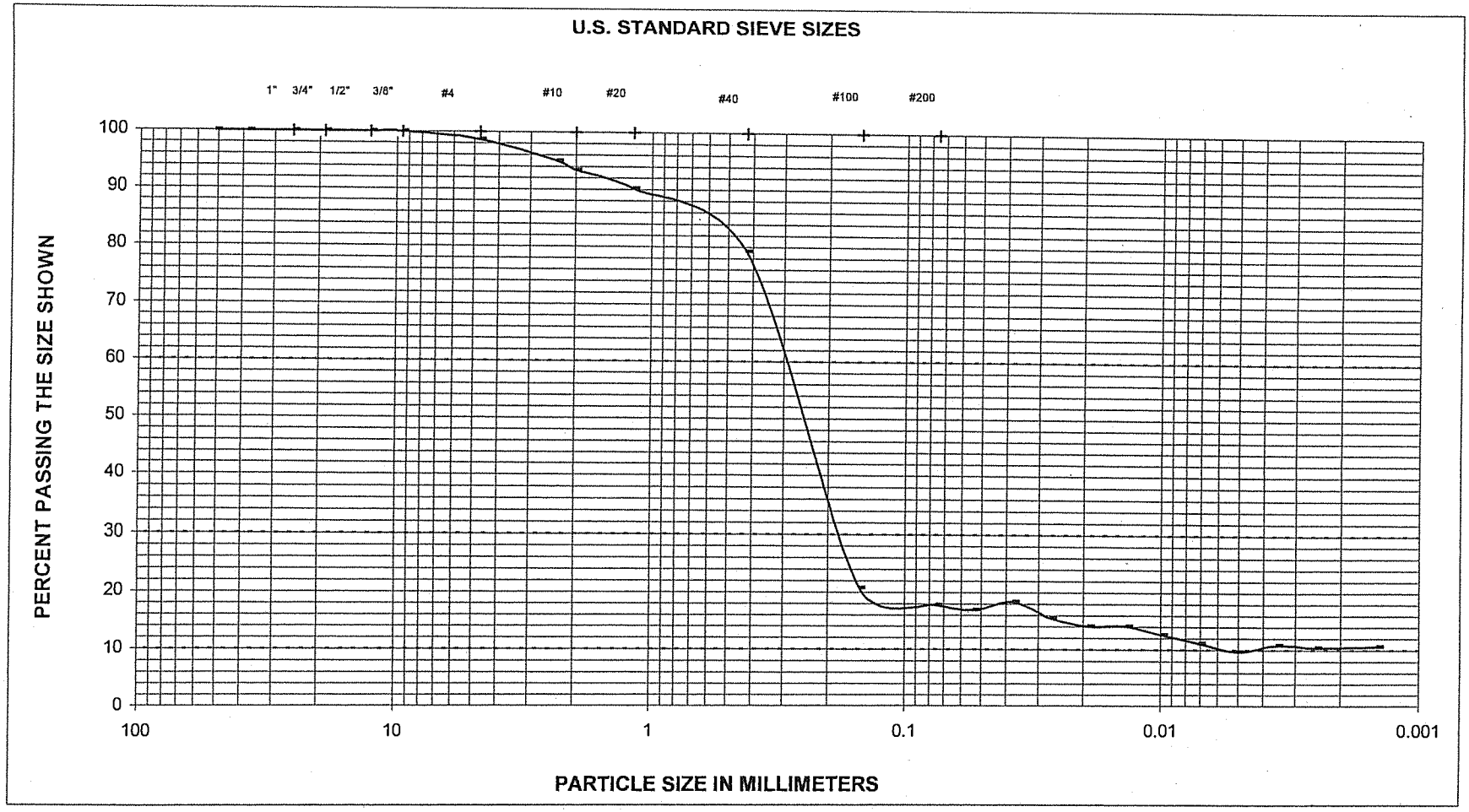
Electronic Filing: Received, Clerk's Office 10/31/2022

GRAIN SIZE DISTRIBUTION CURVE

Project Name: KPRG Laboratory Testing
Terracon Project #: 58055075
Sample Description: Silty sand, trace gravel, dark brown

Boring Number: WS-GT-2
Sample No.:

Date: 8/26/2005
Sample type.:



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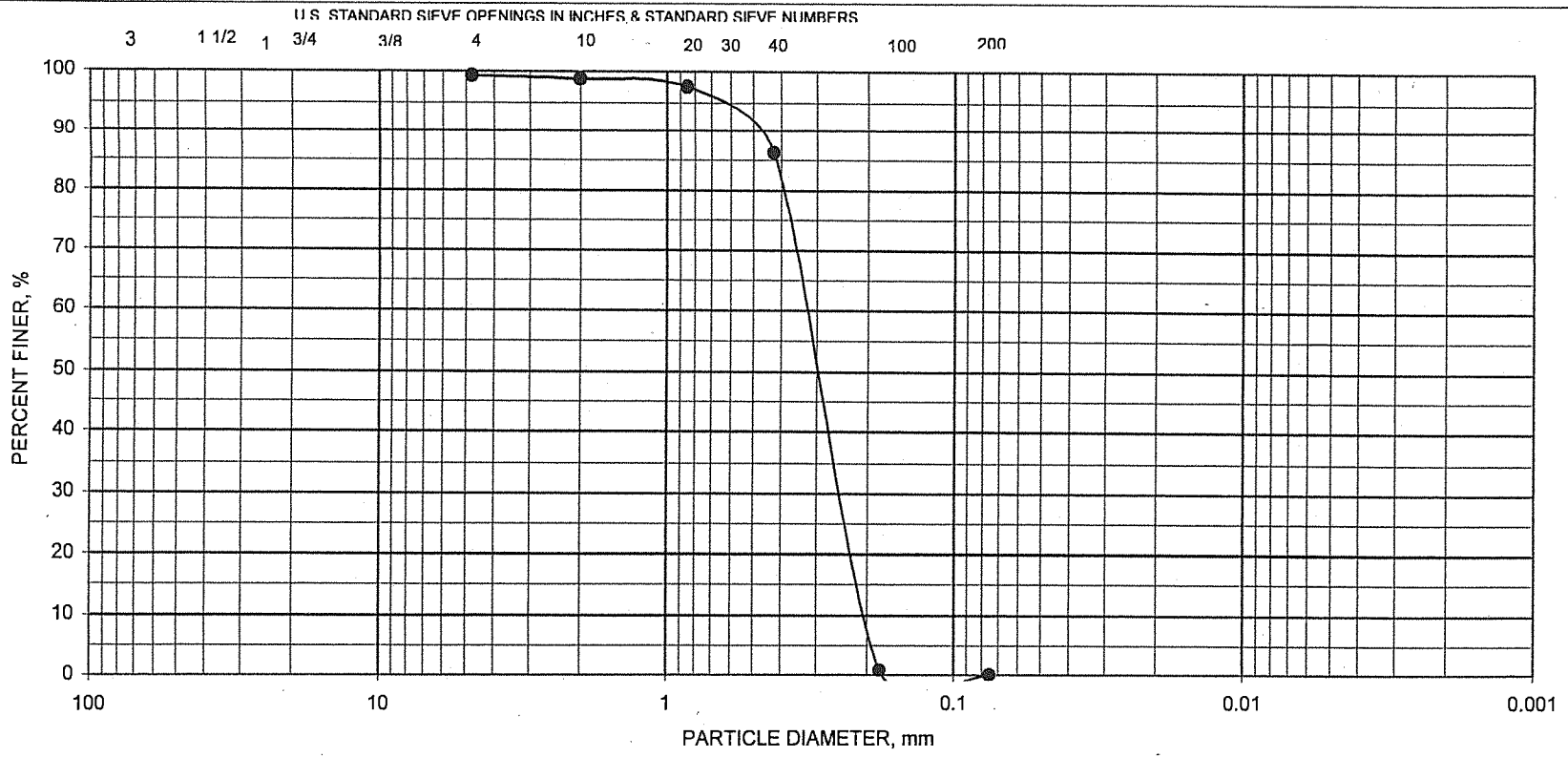

GRAVEL		Sand			Silt or Clay
Coarse	Fine	Coarse	Medium	Fine	

GRAIN SIZE DISTRIBUTION CURVE

BORING NO.	SAMPLE NO.	DEPTH, feet	ASTM DESCRIPTION	UNIFIED SYMBOL	NAT. WC, %	ATTERBERG LIMITS LL	PL	PI
WSGT-3			Fine Sand, Trace Silt	SP	11.2	NP	NP	NP

PROJECT KPRG Laboratory Testing

JOB NO. 58055075 DATE 9/22/2005

Terracon

Sieve WSGT-3.xls

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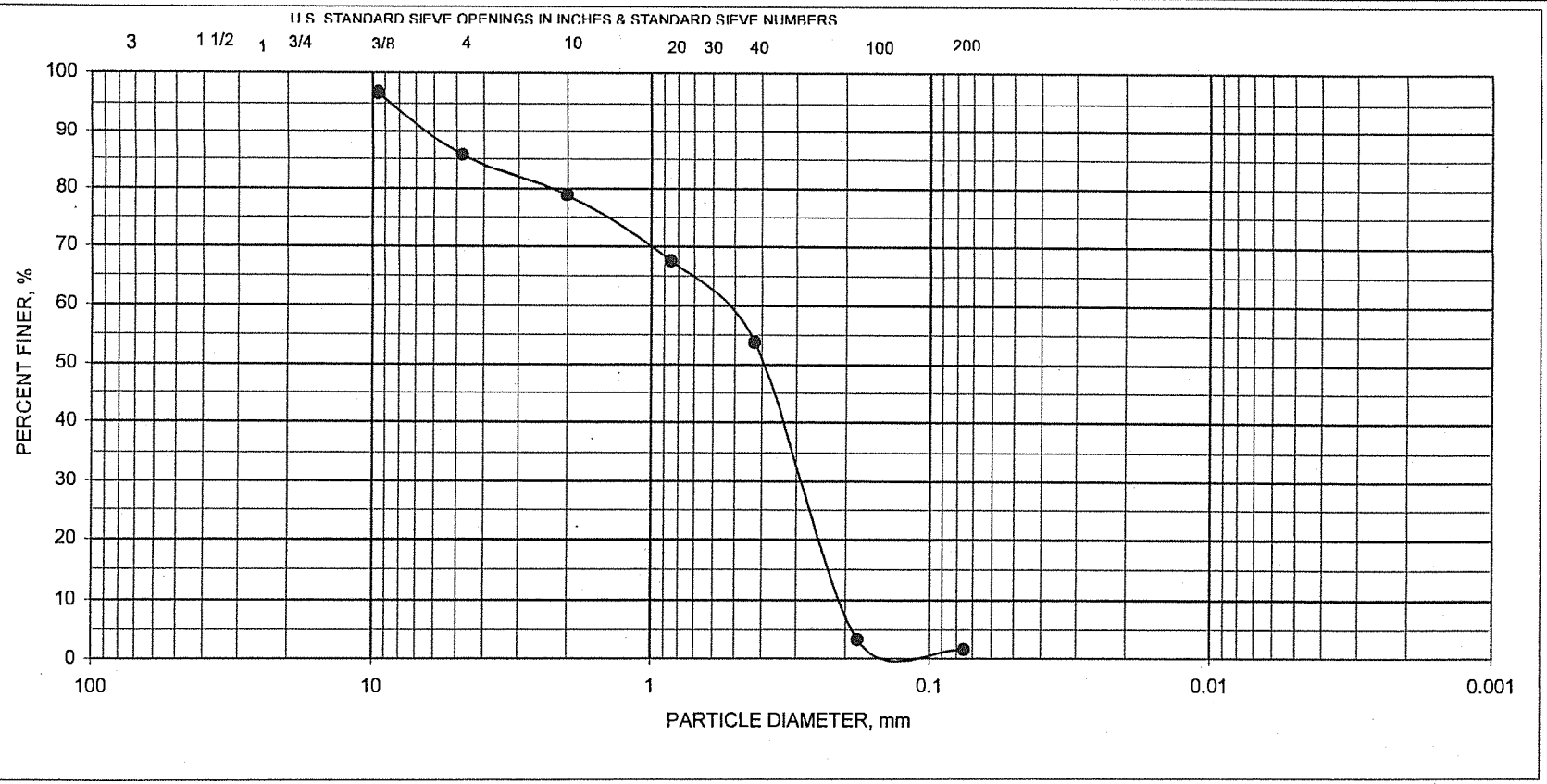

GRAVEL		Sand			Silt or Clay
Coarse	Fine	Coarse	Medium	Fine	

GRAIN SIZE DISTRIBUTION CURVE

BORING NO.	SAMPLE NO.	DEPTH, feet	ASTM DESCRIPTION	UNIFIED SYMBOL	NAT. WC, %	ATTERBERG LIMITS LL	PL	PI
WSGT-4		5 to 10'-Bottom of Sample	Fine to Medium Sand With Gravel	SP	9.5	NP	NP	NP

PROJECT KPRG Laboratory Testing

JOB NO. 58055075 DATE 9/22/2005

Terracon

Sieve WSGT-4.xls

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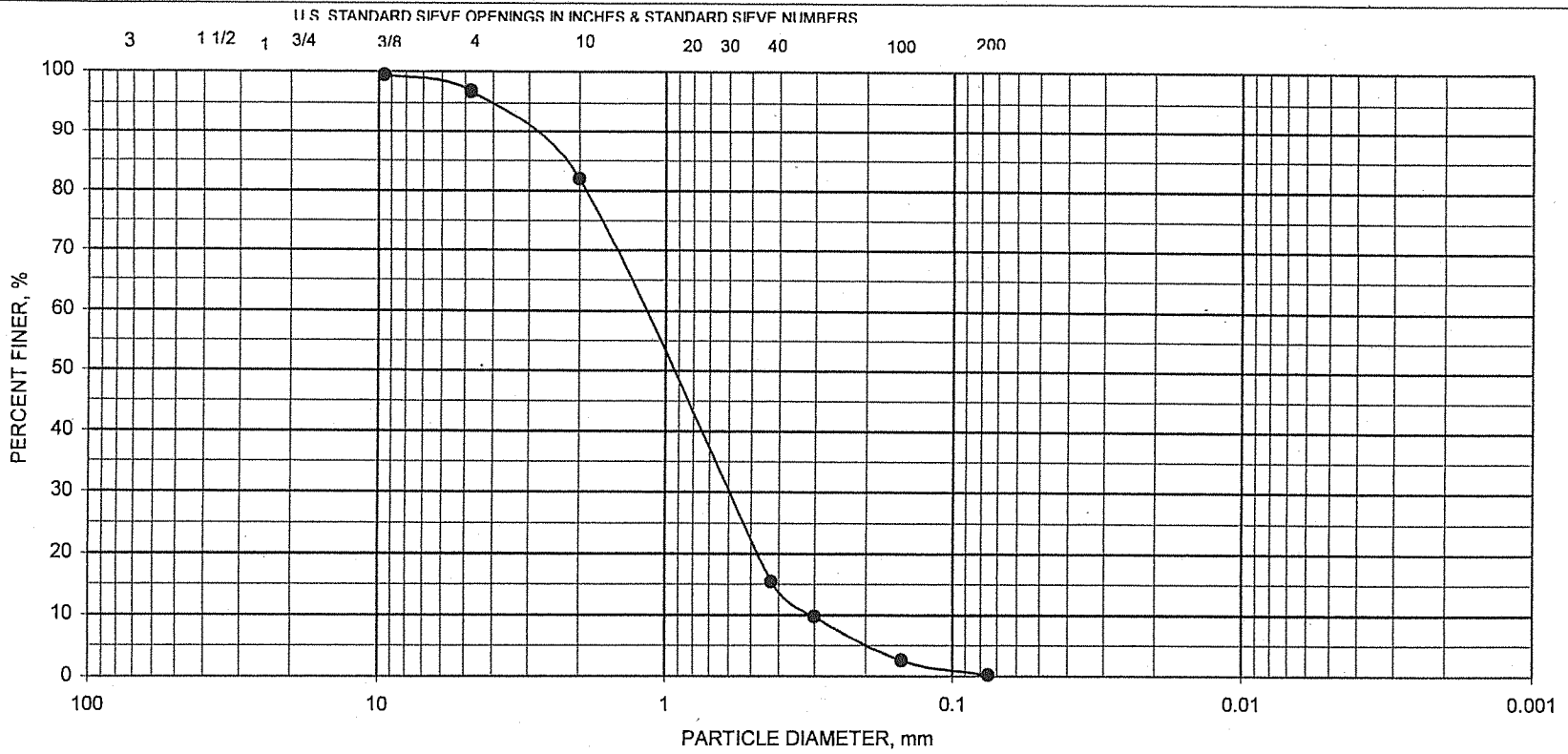

GRAVEL		Sand			Silt or Clay
Coarse	Fine	Coarse	Medium	Fine	

GRAIN SIZE DISTRIBUTION CURVE

BORING NO.	SAMPLE NO.	DEPTH, feet	ASTM DESCRIPTION	UNIFIED SYMBOL	NAT. WC, %	ATTERBERG LIMITS LL	PL	PI
WSGT-5		22 to 27'	Sand, trace gravel, black	SP	9.5	NP	NP	NP

PROJECT KPRG Laboratory Testing

JOB NO. 58055075 DATE 9/28/2005

Terracon

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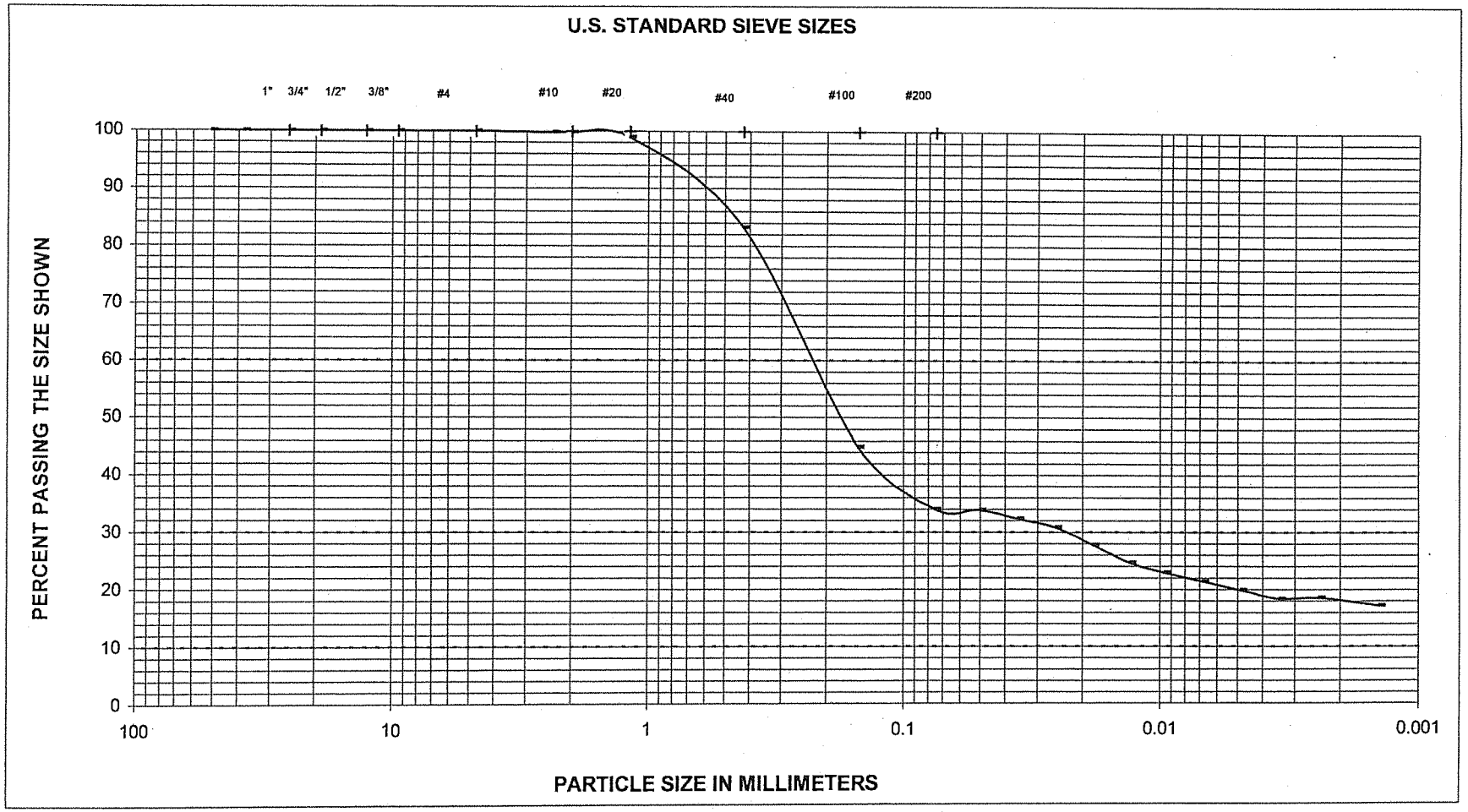
GRAIN SIZE DISTRIBUTION CURVE

Project Name: KPRG Laboratory Testing
Boring Number PS-GT-1
Date: 8/29/2005
Terracon Project #: 58055075
Sample No.:
Sample type.:
Sample Description: Clayey sand, dark brown



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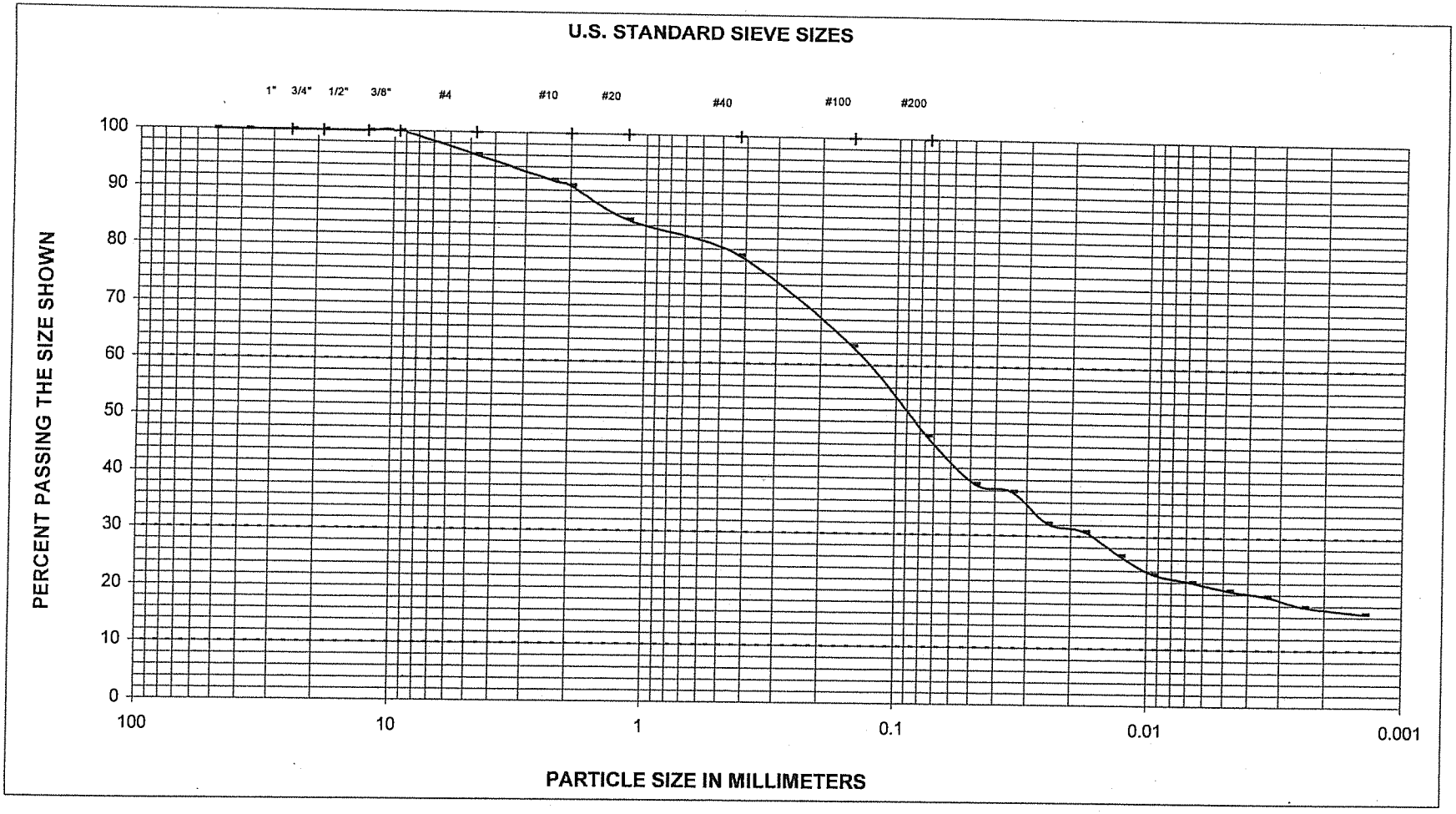
GRAIN SIZE DISTRIBUTION CURVE

Project Name: KPRG Laboratory Testing
Terracon Project #: 58055074
Sample Description: Clayey sand, trace gravel, medium to coarse grained, brown

Boring Number PS-GT-2
Sample No.:

Date: 8/25/2005
Sample type.:



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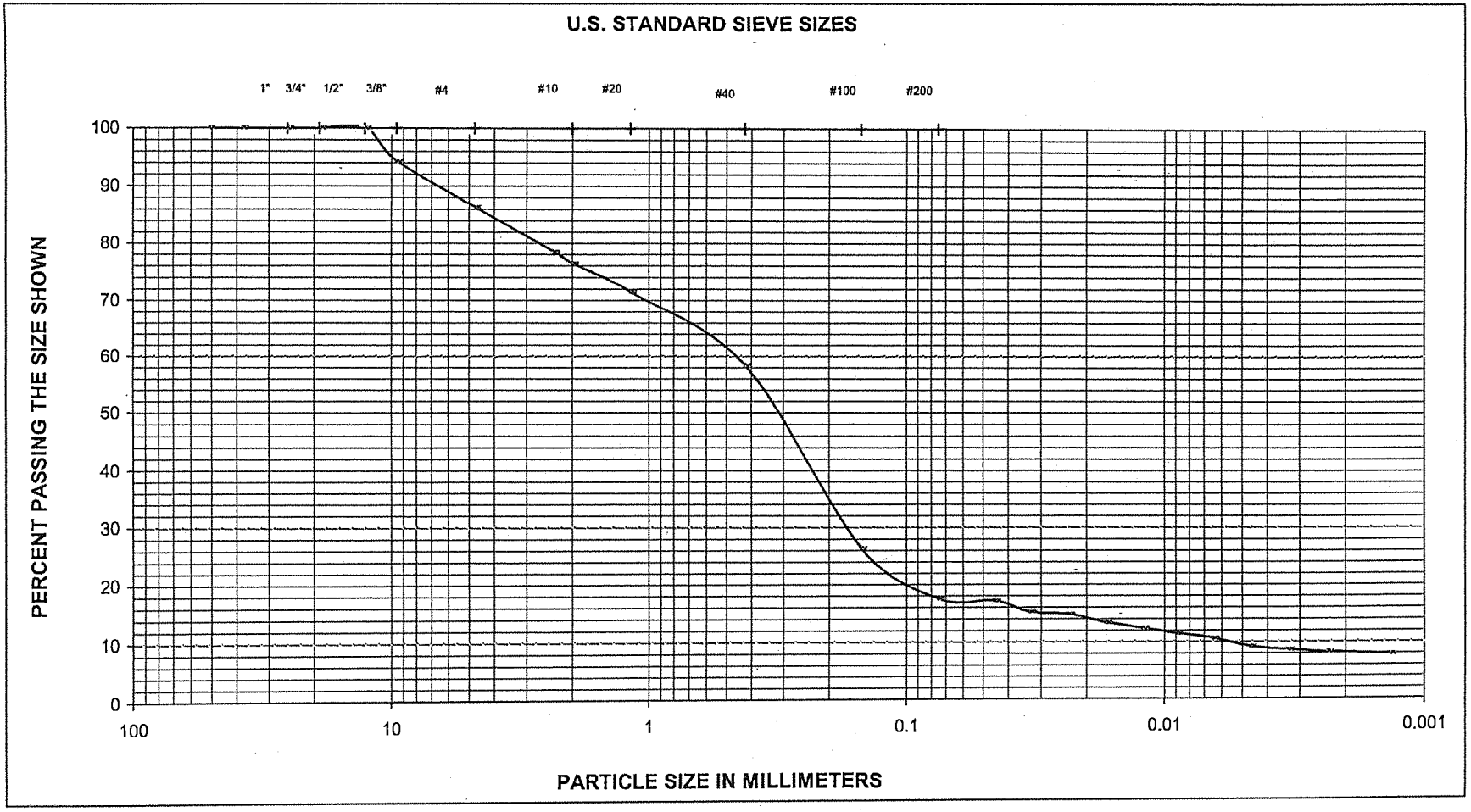
GRAIN SIZE DISTRIBUTION CURVE

Project Name: KPRG Laboratory Testing | Boring Number PS-GT-3 | Date: 8/26/2005

Terracon Project #: 58055075 | Sample No.: 7-9' | Sample type.:

Sample Description: Sand, trace clay, gravel and organics, dark brown



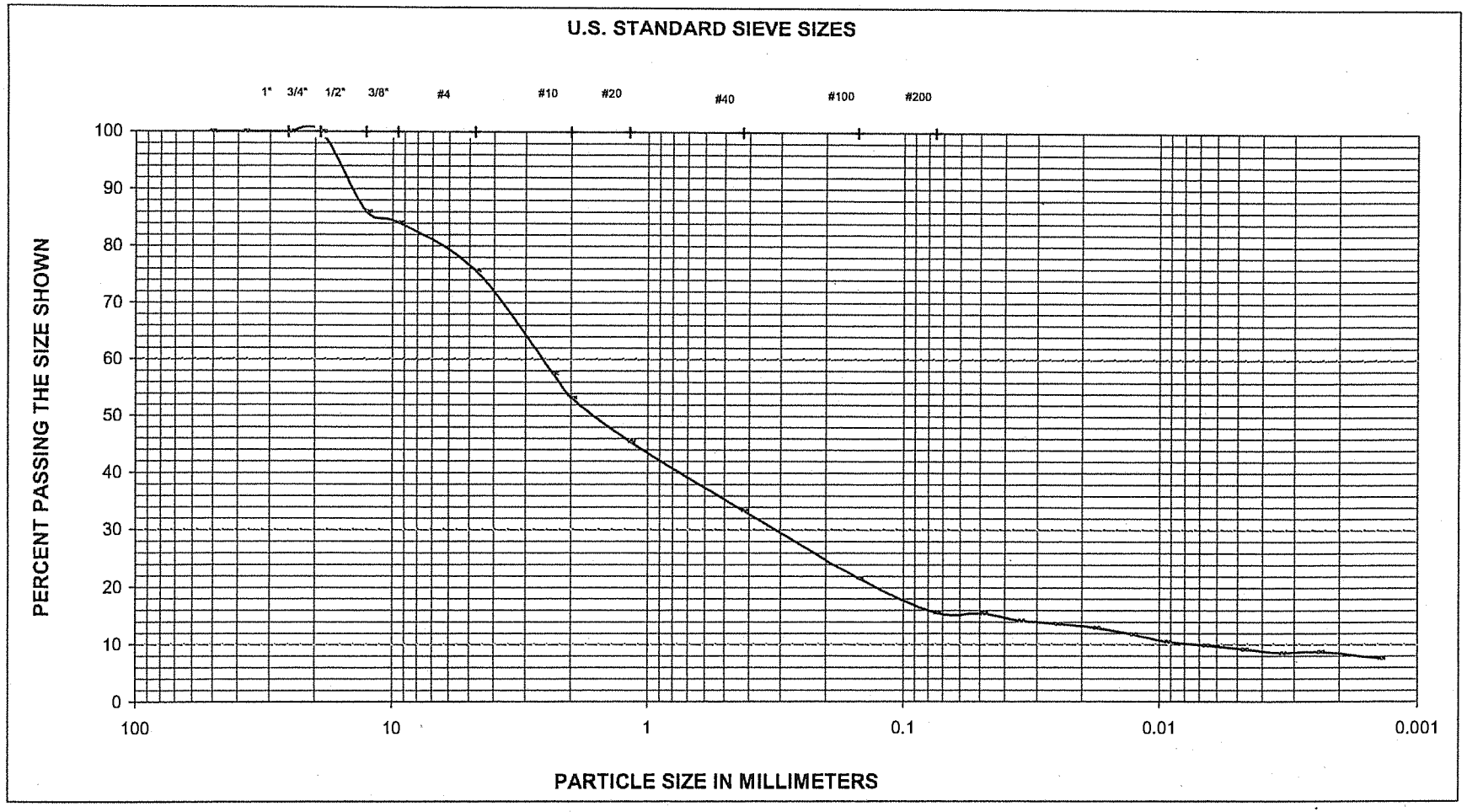
Electronic Filing: Received, Clerk's Office 10/31/2022

GRAIN SIZE DISTRIBUTION CURVE

Project Name: KPRG Laboratory Testing Boring Number PS-GT-4 Date: 8/29/2005

Terracon Project #: 58055075 Sample No.: Sample type.:

Sample Description: Sand, with clay and gravel, trace organics, fine to coarse grained, dark brown



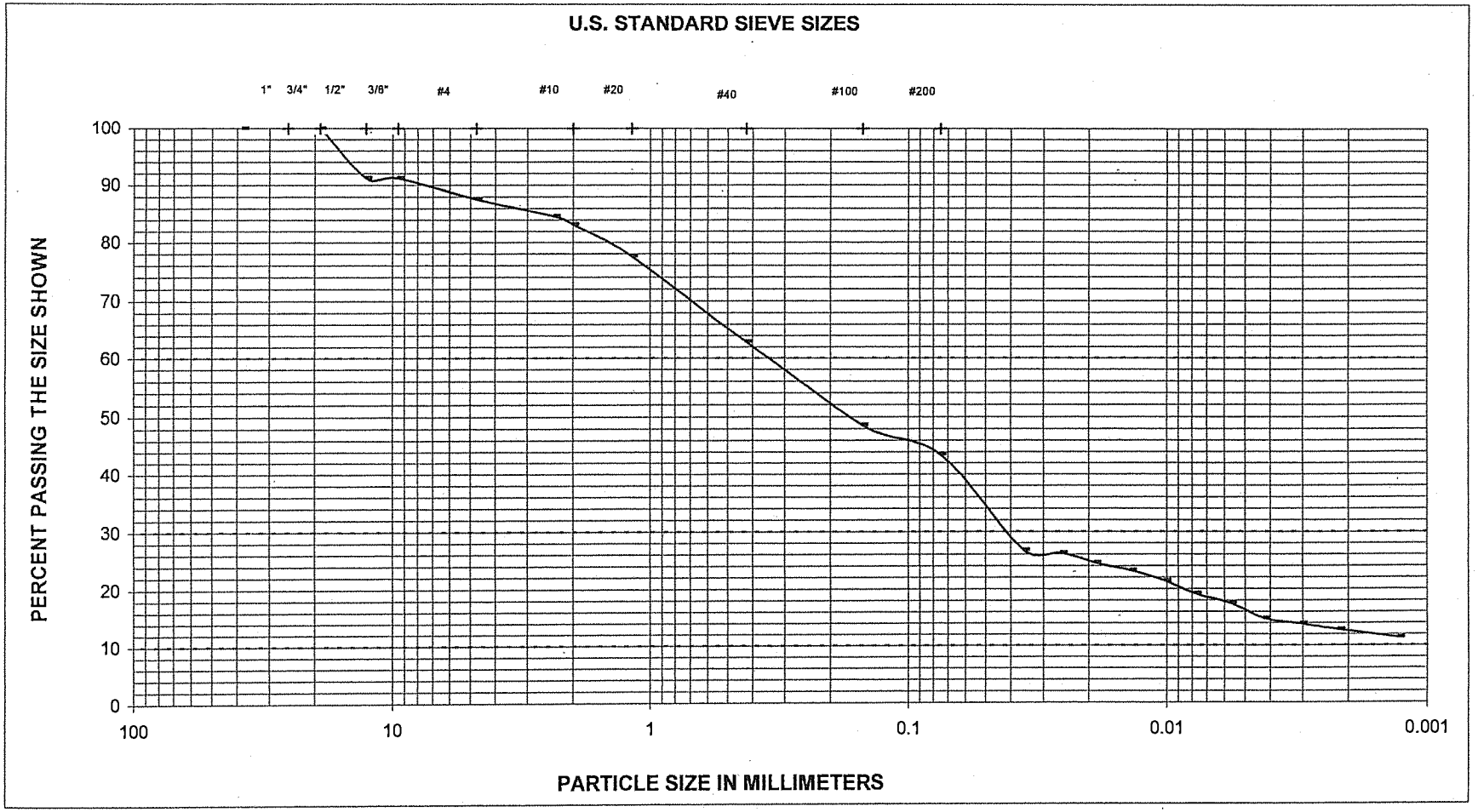
Electronic Filing: Received, Clerk's Office 10/31/2022

GRAIN SIZE DISTRIBUTION CURVE

Project Name: KPRG Laboratory Testing Boring Number PS-GT-5 Date: 8/26/2005

Terracon Project #: 58055075 Sample No.: Sample type.:

Sample Description: Clayey Sand, trace gravel, brown



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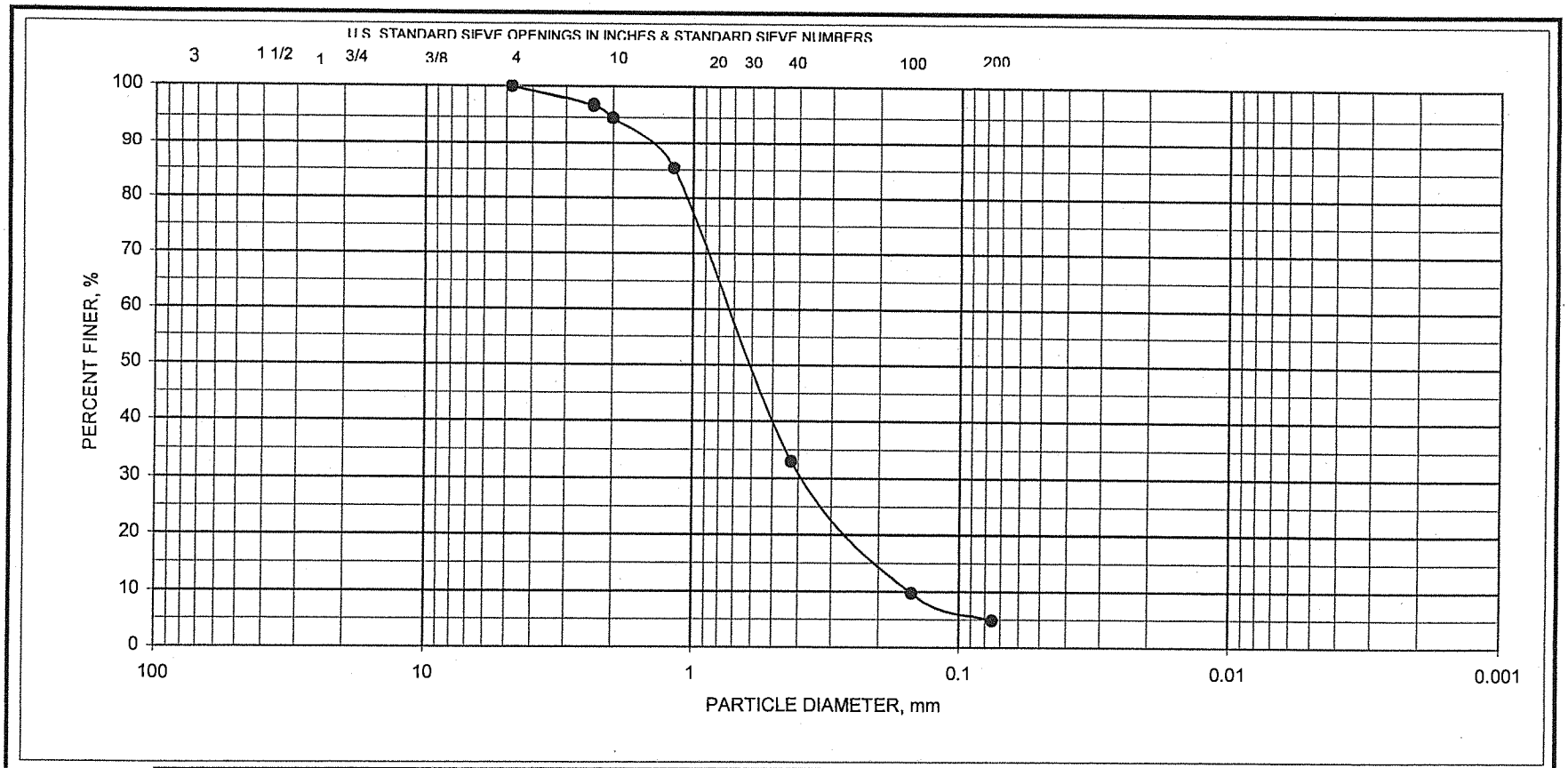

GRAVEL		Sand			Silt or Clay
Coarse	Fine	Coarse	Medium	Fine	

GRAIN SIZE DISTRIBUTION CURVE

BORING NO.	SAMPLE NO.	DEPTH, feet	ASTM DESCRIPTION	UNIFIED SYMBOL	NAT. WC, %	ATTERBERG LIMITS LL	PL	PI
PS-GT-6		15-20'	Fill: Sand, fine to medium coarse, trace gravel, dark brown	SP				

PROJECT KPRG Laboratory Testing

JOB NO. 58055075 DATE 8/25/2005

Terracon

Grad PS-GT-6.xls

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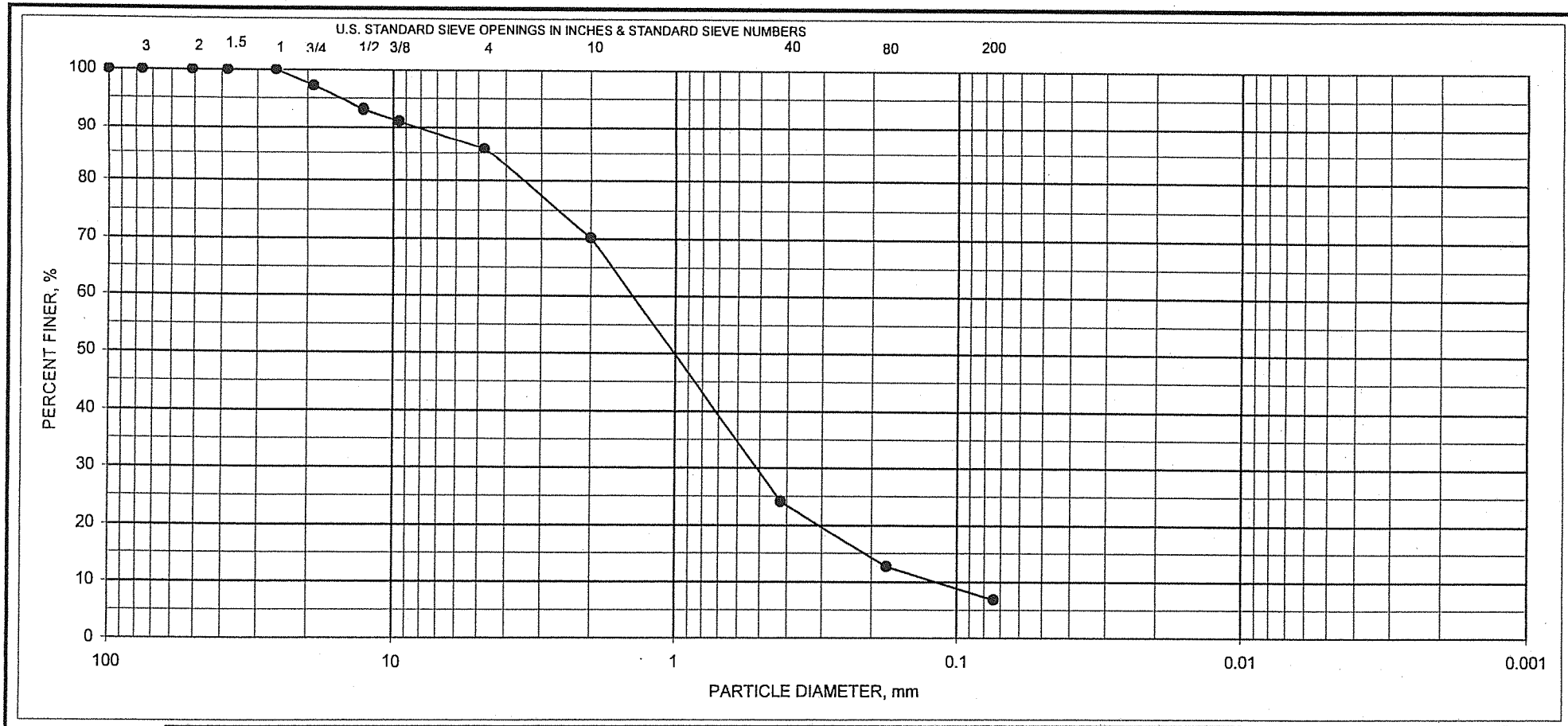


GRAVEL		Sand			Silt or Clay
Coarse	Fine	Coarse	Medium	Fine	

GRAIN SIZE DISTRIBUTION CURVE

BORING NO.	SAMPLE NO.	DEPTH, feet	ASTM DESCRIPTION	UNIFIED SYMBOL	NAT. WC, %	ATTERBERG LIMITS LL	PL	PI
PS-GT-7		10.0 TO 13.0	WELL GRADED SAND WITH SILT, DARK GRAY	SW-SM	7.0	21	18	3

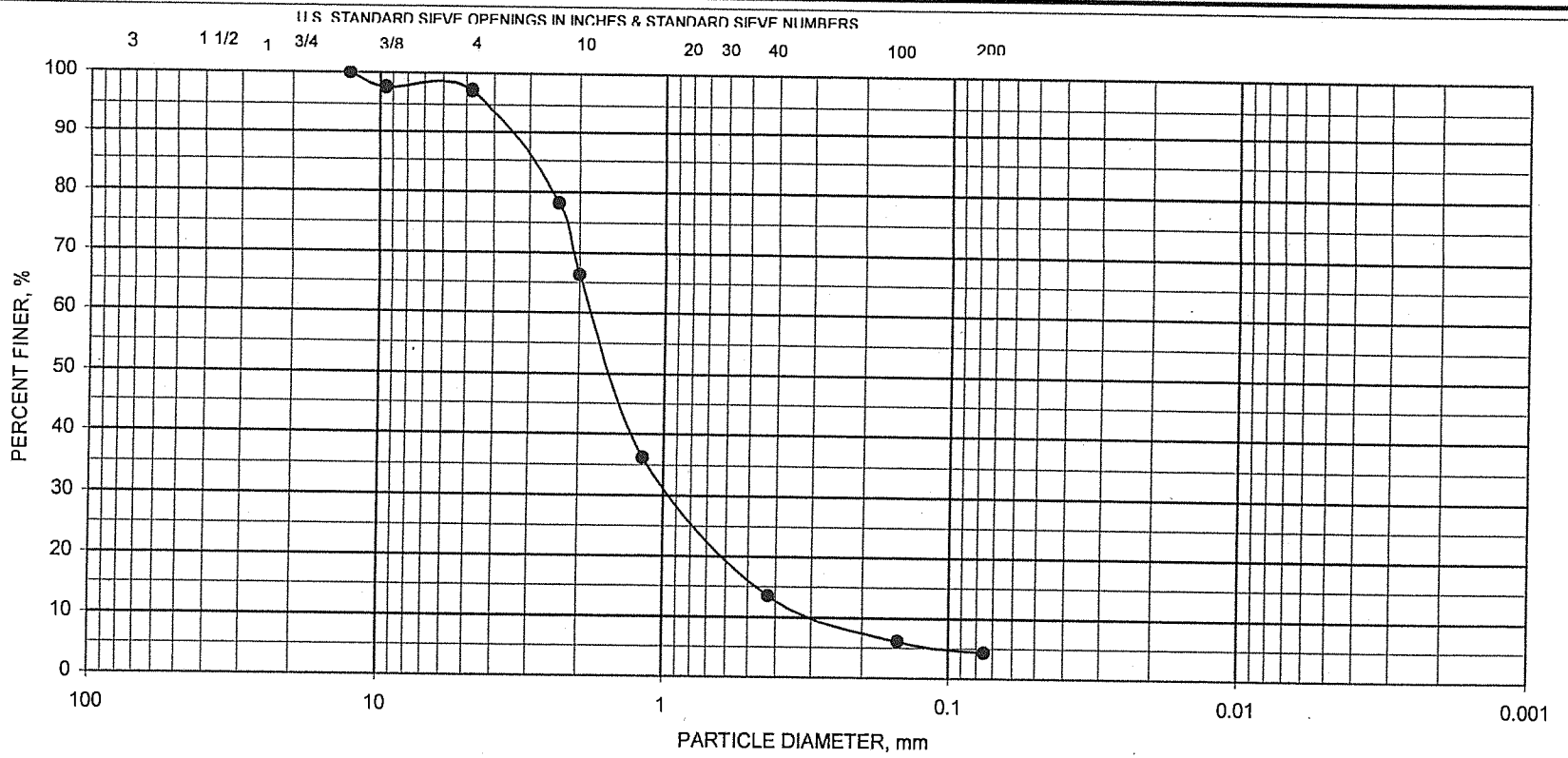
PROJECT KPRG LABORATORY TESTING

JOB NO. 58055075 DATE 10/7/2005

C:\Documents and Settings\takauffeld\Local Settings\Temporary Internet Files\OLK16\[58055075GradationPlot-PS-GT7-10.xls]REPORT

Terracon

Electronic Filing: Received, Clerk's Office 10/31/2022



GRAVEL		Sand			Silt or Clay
Coarse	Fine	Coarse	Medium	Fine	

GRAIN SIZE DISTRIBUTION CURVE

BORING NO.	SAMPLE NO.	DEPTH, feet	ASTM DESCRIPTION	UNIFIED SYMBOL	NAT. WC, %	ATTERBERG LIMITS LL	PL	PI
PS-GT-8 (top)		10 to 15'	Cinders, metal shavings, glass, black					

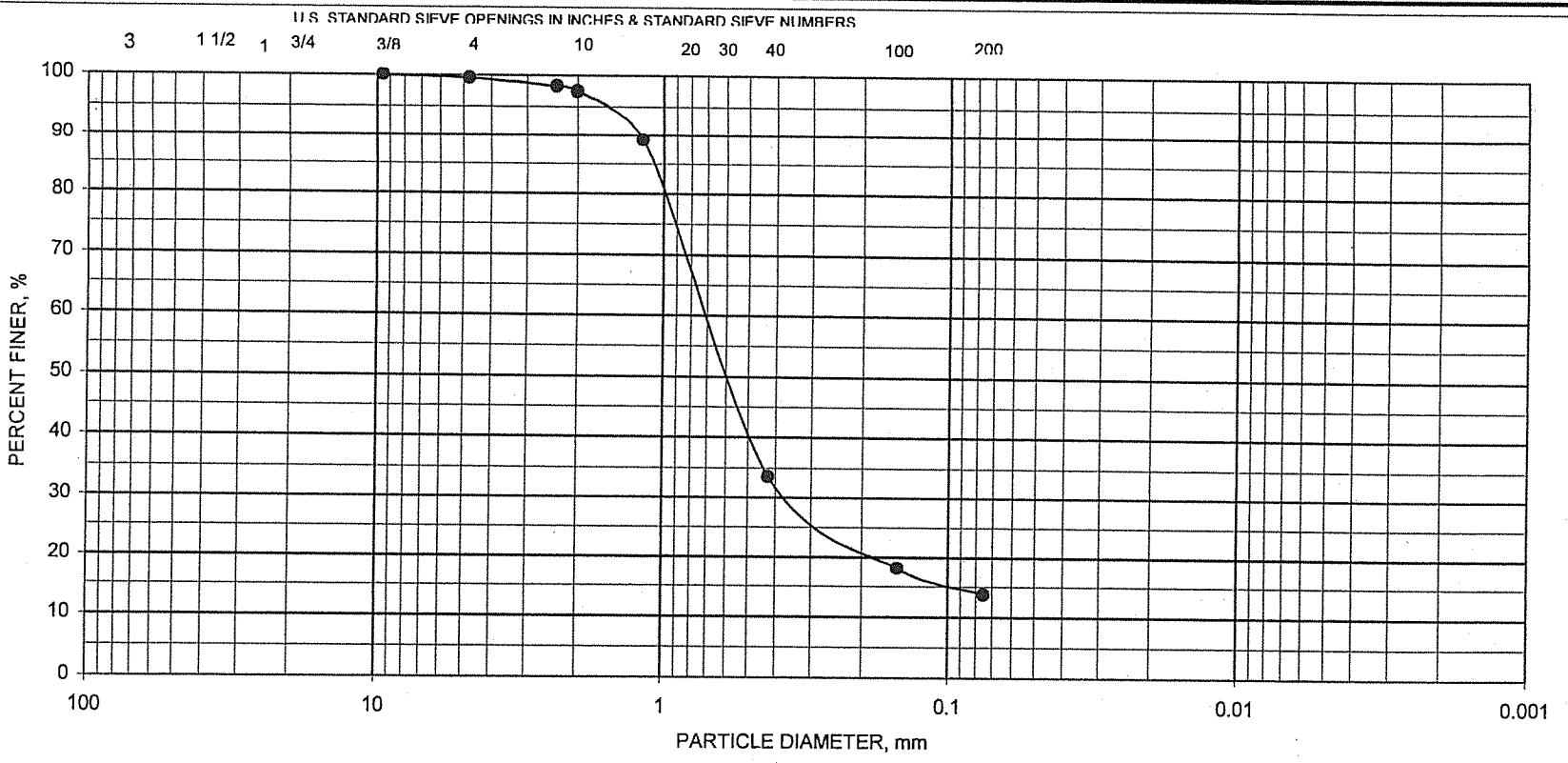
PROJECT KPRG Laboratory Testing

JOB NO. 58055075 DATE 8/25/2005

Terracon

Sieve PS-GT-8

Electronic Filing: Received, Clerk's Office 10/31/2022



GRAVEL		Sand			Silt or Clay
Coarse	Fine	Coarse	Medium	Fine	

GRAIN SIZE DISTRIBUTION CURVE

BORING NO.	SAMPLE NO.	DEPTH, feet	ASTM DESCRIPTION	UNIFIED SYMBOL	NAT. WC, %	ATTERBERG LIMITS LL	PL	PI
PS-GT-8 (bottom)		10 to 15'	Silty Sand, trace clay, dark gray	SM				

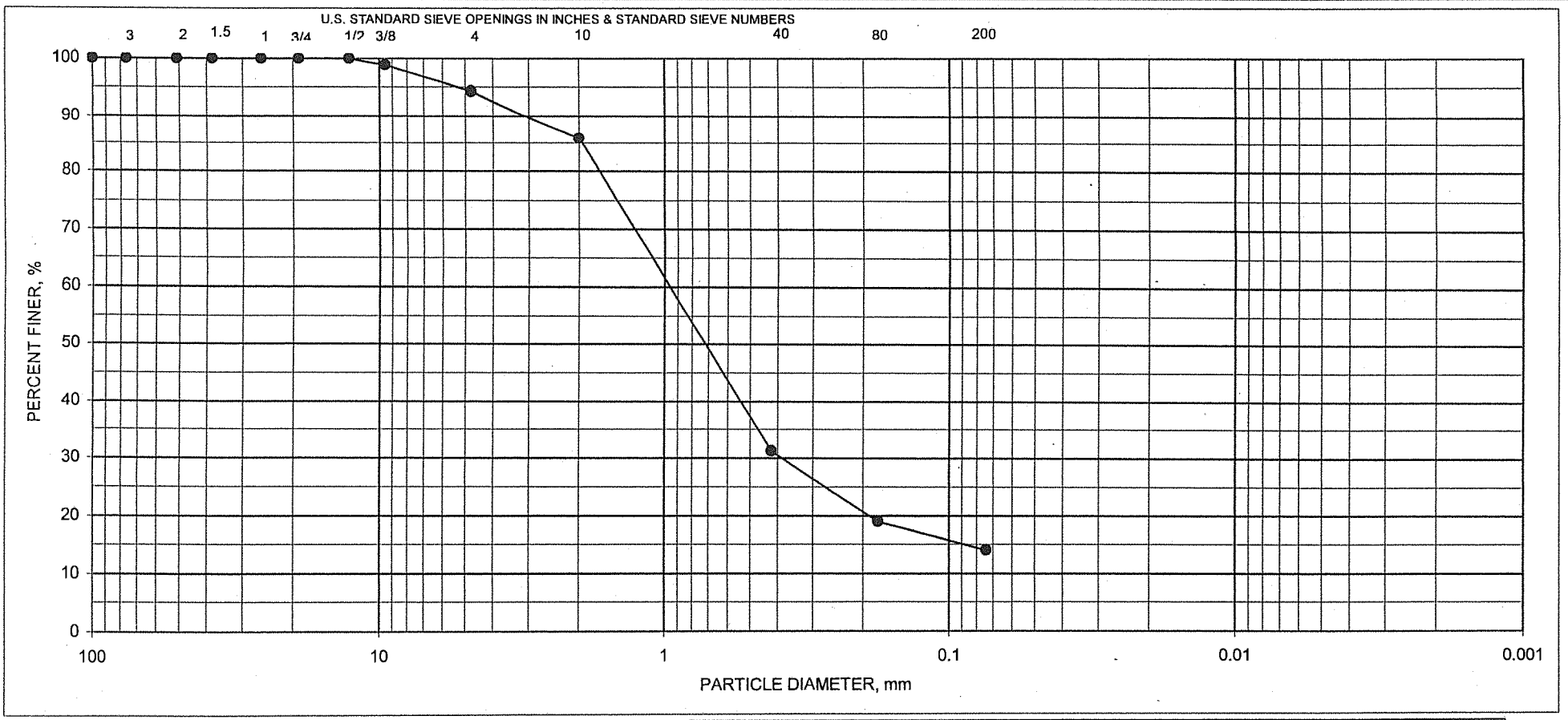
PROJECT KPRG Laboratory Testing

JOB NO. 58055075 DATE 8/25/2005

Terracon

Sieve PS-GT-8 (bottom).xls

Electronic Filing: Received, Clerk's Office 10/31/2022



GRAVEL		Sand			Silt or Clay
Coarse	Fine	Coarse	Medium	Fine	

GRAIN SIZE DISTRIBUTION CURVE

BORING NO.	SAMPLE NO.	DEPTH, feet	ASTM DESCRIPTION	UNIFIED SYMBOL	NAT. WC, %	ATTERBERG LIMITS LL	PL	PI
PS-GT-9	TOP 16"	15.0 TO 20.0	SILTY SAND, DARK GRAY	SM	8.9	22	19	3

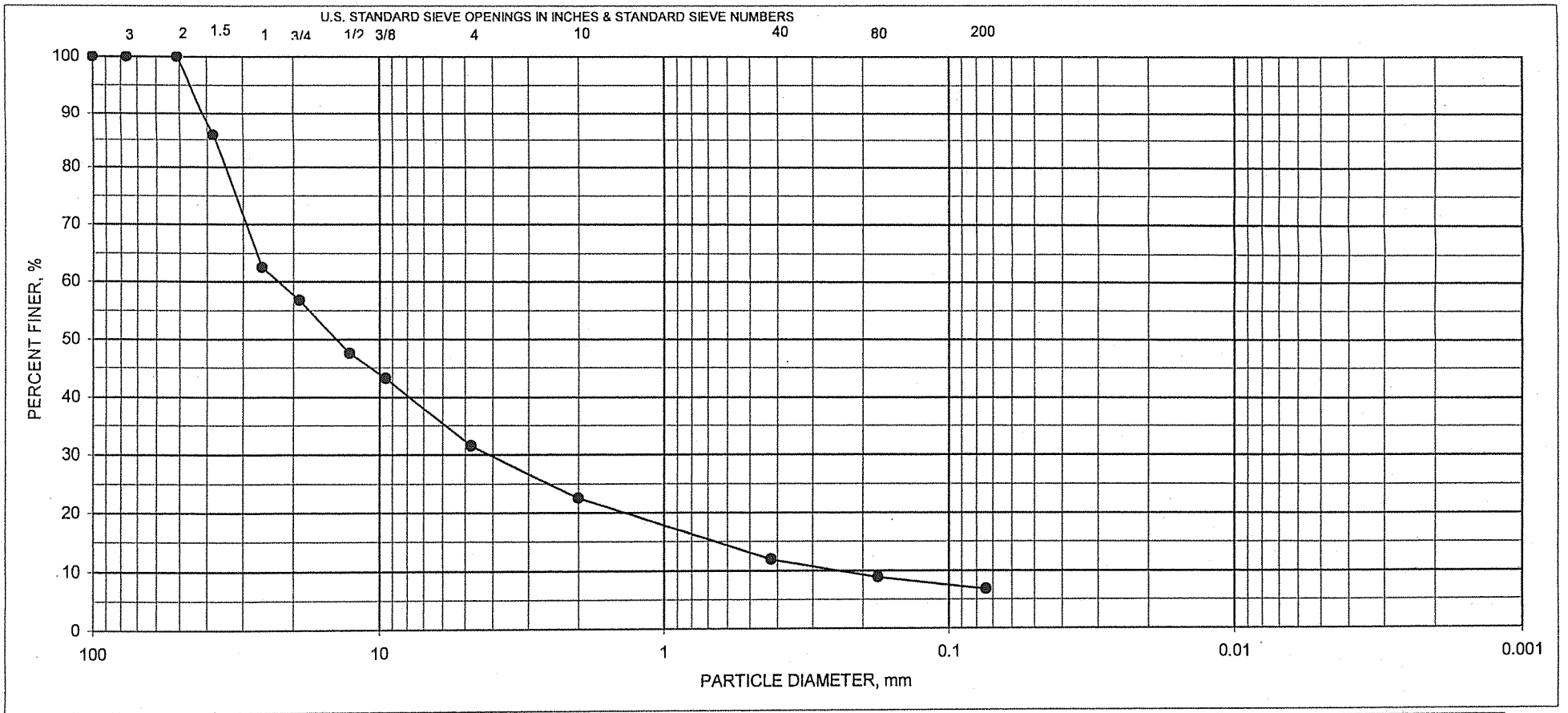
PROJECT KPRG LABORATORY TESTING

JOB NO. 58055075 DATE 10/7/2005

C:\Documents and Settings\takauffeld\Local Settings\Temporary Internet Files\OLK16\[58055075GradationPlot-PS-GT9-15-A.xls]REPORT

Terracon

Electronic Filing: Received, Clerk's Office 10/31/2022



GRAVEL		Sand			Silt or Clay
Coarse	Fine	Coarse	Medium	Fine	

GRAIN SIZE DISTRIBUTION CURVE

BORING NO.	SAMPLE NO.	DEPTH, feet	ASTM DESCRIPTION	UNIFIED SYMBOL	NAT. WC, %	ATTERBERG LIMITS LL	PL	PI
PS-GT-9	MIDDLE 8"	15.0 TO 20.0	POORLY GRADED GRAVEL WITH SILT & SAND, DARK YELLOWISH BROWN	GP-GM	3.3			

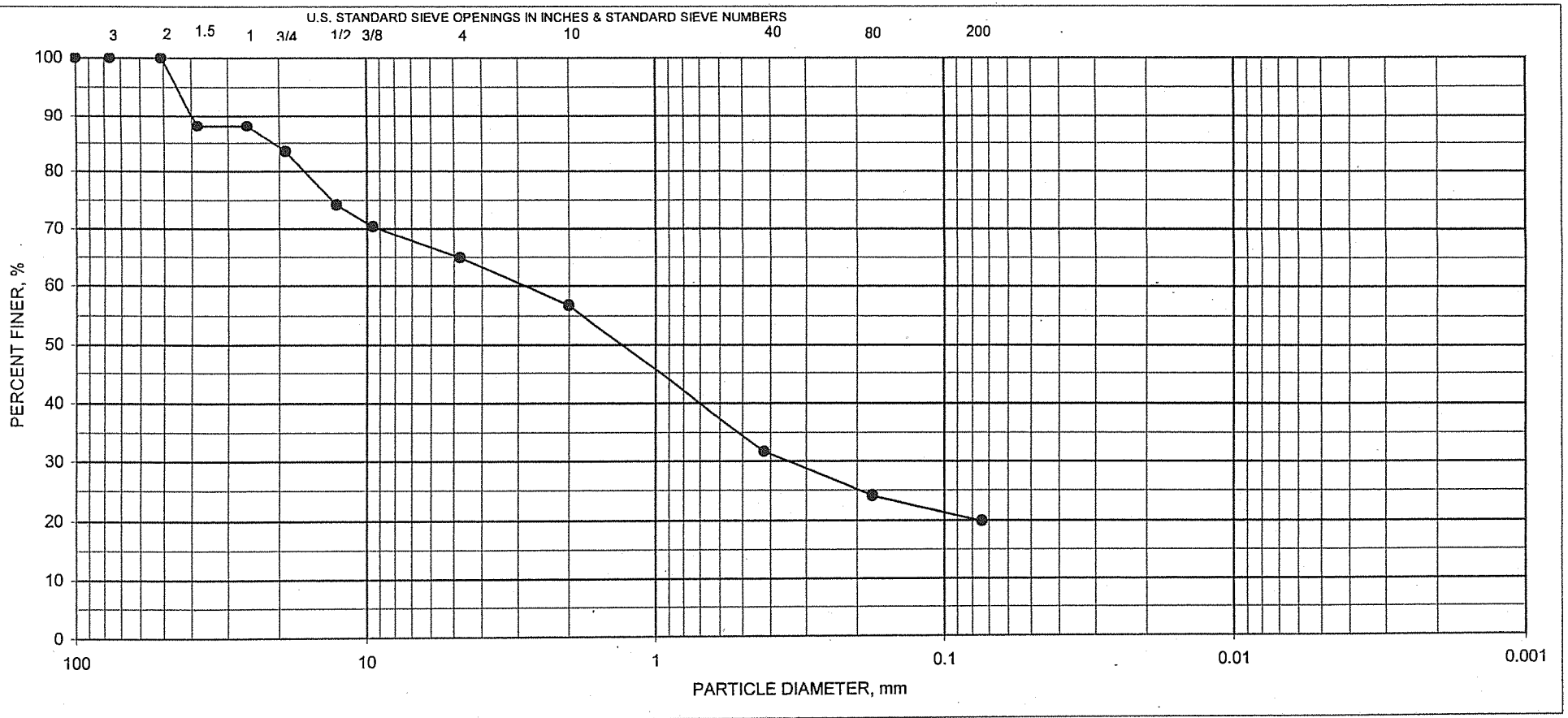
PROJECT KPRG LABORATORY TESTING

JOB NO. 58055075 DATE 10/7/2005

Terracon

C:\Documents and Settings\takauffeld\Local Settings\Temporary Internet Files\OLK16\[58055075GradationPlot-PS-GT9-15-B.xls]REPORT

Electronic Filing: Received, Clerk's Office 10/31/2022



GRAVEL		Sand			Silt or Clay
Coarse	Fine	Coarse	Medium	Fine	

GRAIN SIZE DISTRIBUTION CURVE

BORING NO.	SAMPLE NO.	DEPTH, feet	ASTM DESCRIPTION	UNIFIED SYMBOL	NAT. WC, %	ATTERBERG LIMITS LL	PL	PI
PS-GT-9	BOTTOM 8"	15.0 TO 20.0	SILTY SAND WITH GRAVEL, DARK GRAY TRACE LIGHT GRAY	SM	16.4	24	21	3

PROJECT KPRG LABORATORY TESTING

JOB NO. 58055075 DATE 10/7/2005

Terracon

C:\Documents and Settings\takauffeld\Local Settings\Temporary Internet Files\OLK16\{58055075GradationPlot-PS-GT9-15-C.xls]REPORT

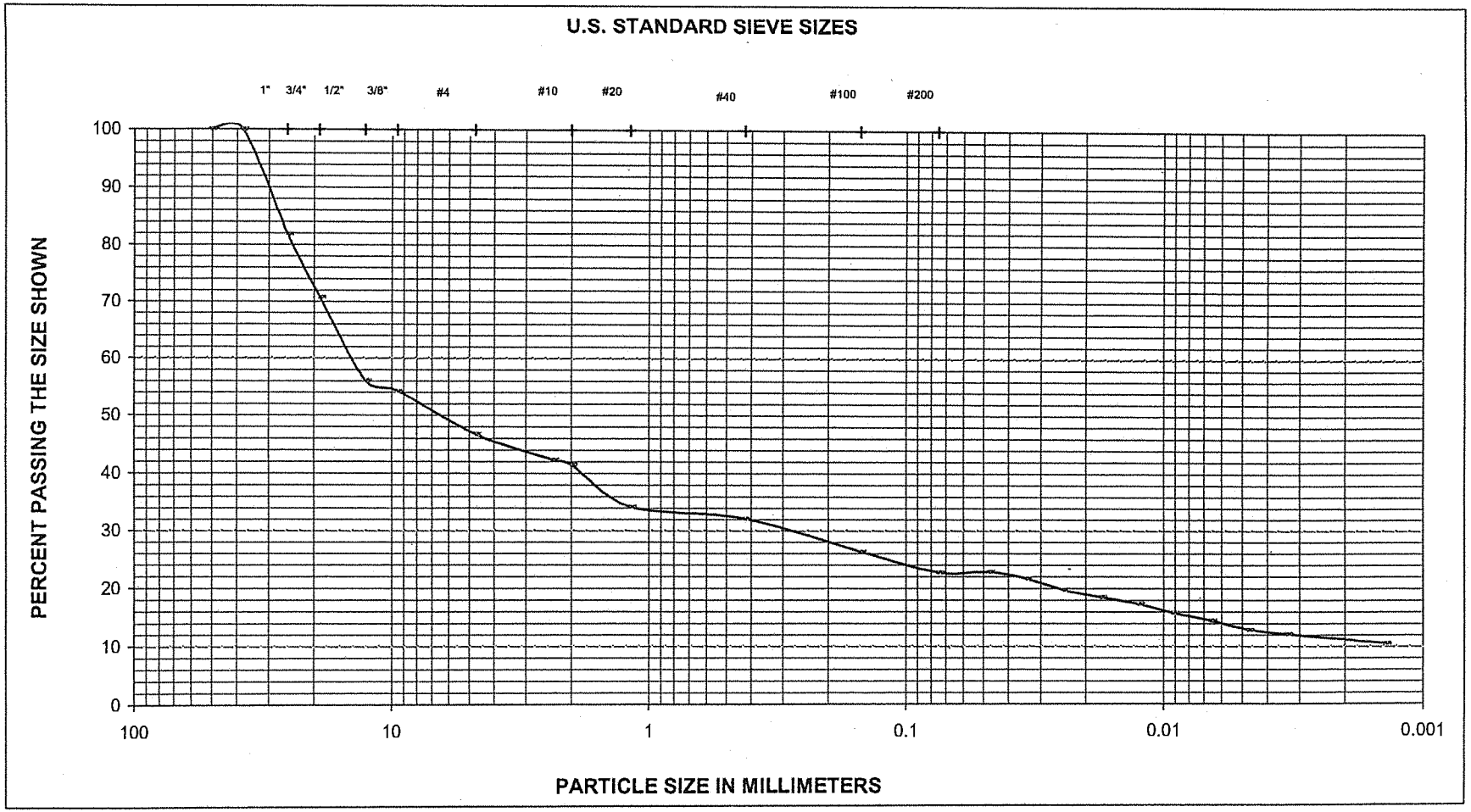
Electronic Filing: Received, Clerk's Office 10/31/2022

GRAIN SIZE DISTRIBUTION CURVE

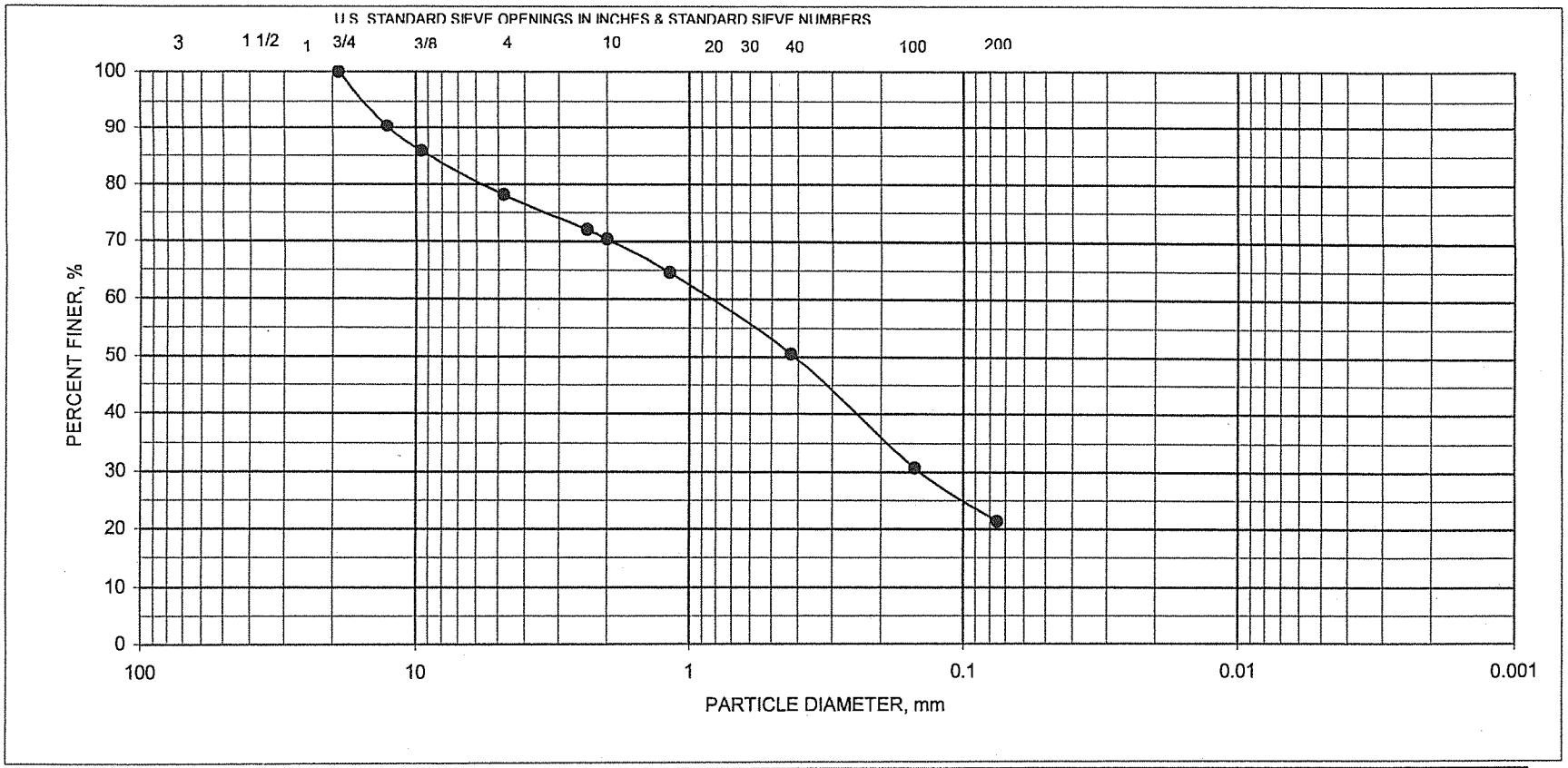
Project Name: KPRG Laboratory Testing
Terracon Project #: 58055075
Sample Description: Sand, with gravel, gray

Boring Number: JS-9-GT-1
Sample No.: 7-12'

Date: 9/26/2005
Sample type.:



Electronic Filing: Received, Clerk's Office 10/31/2022



GRAVEL		Sand			Silt or Clay
Coarse	Fine	Coarse	Medium	Fine	

GRAIN SIZE DISTRIBUTION CURVE

BORING NO.	SAMPLE NO.	DEPTH, feet	ASTM DESCRIPTION	UNIFIED SYMBOL	NAT. WC, %	ATTERBERG LIMITS LL	PL	PI
JS-9-GT-2		7 to 11.5'	Clayey Sand, with organics, with gravel, dark brown	SC				

PROJECT KPRG Laboratory Testing

JOB NO. 58055075 DATE 7/11/2005

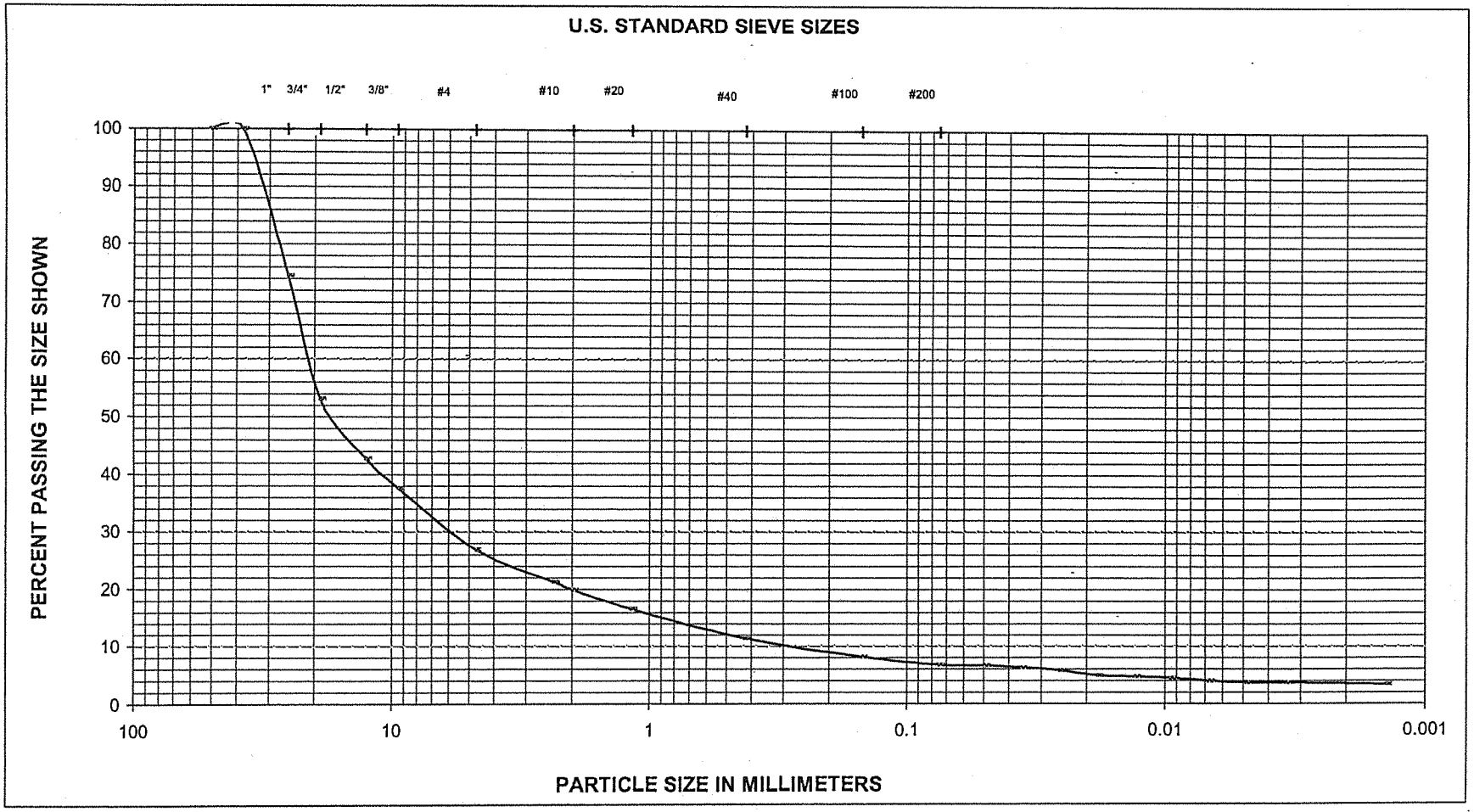
Terracon

Sieve JS-9-GT-2.xls

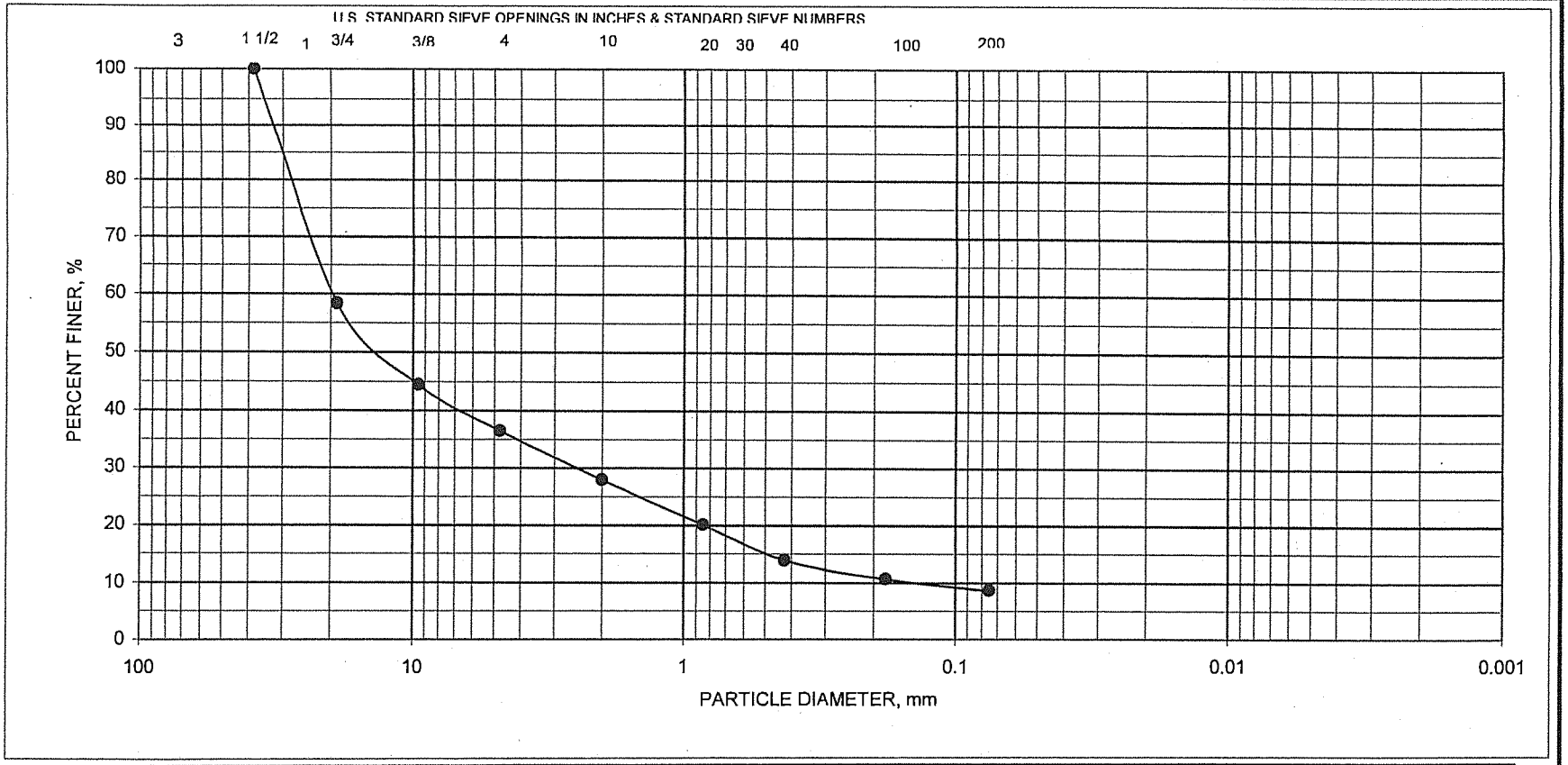
Electronic Filing: Received, Clerk's Office 10/31/2022

GRAIN SIZE DISTRIBUTION CURVE

Project Name: KPRG Laboratory Testing
Boring Number JS-9-GT-3
Date: 9/26/2005
Terracon Project #: 58055075
Sample No.: 8-13'
Sample type.:
Sample Description: Sand, with gravel, gray



Electronic Filing: Received, Clerk's Office 10/31/2022



GRAVEL		Sand			Silt or Clay
Coarse	Fine	Coarse	Medium	Fine	

GRAIN SIZE DISTRIBUTION CURVE

BORING NO.	SAMPLE NO.	DEPTH, feet	ASTM DESCRIPTION	UNIFIED SYMBOL	NAT. WC, %	ATTERBERG LIMITS LL	PL	PI
JS29GT-1		19 to 24'	Sandy Gravel, Trace Clay	GW		NP	NP	NP

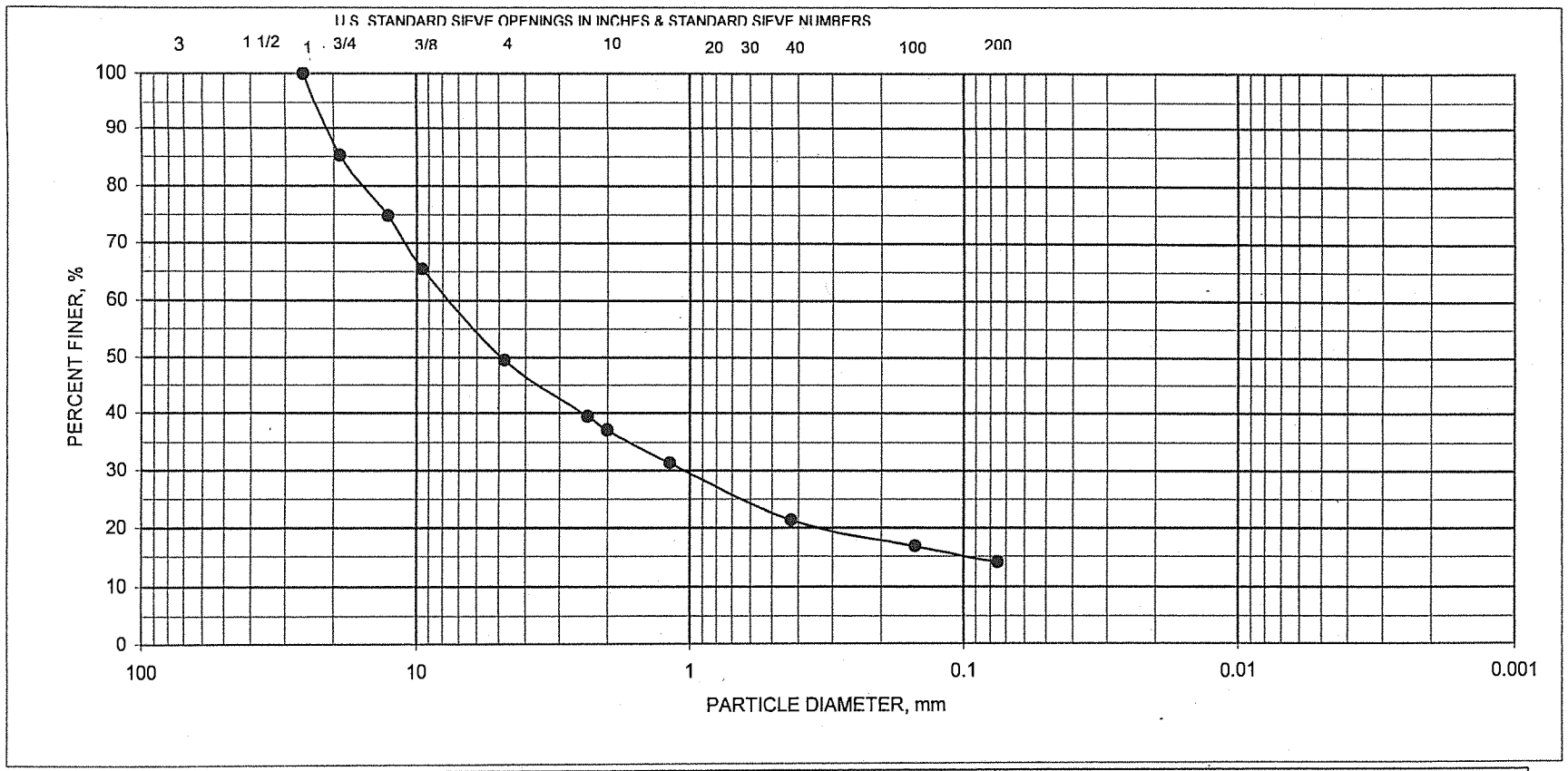
PROJECT KPRG Laboratory Testing

JOB NO. 58055075 DATE 9/21/2005

Terracon

Sieve JS29GT-1.xls

Electronic Filing: Received, Clerk's Office 10/31/2022



GRAVEL		Sand			Silt or Clay
Coarse	Fine	Coarse	Medium	Fine	

GRAIN SIZE DISTRIBUTION CURVE

BORING NO.	SAMPLE NO.	DEPTH, feet	ASTM DESCRIPTION	UNIFIED SYMBOL	NAT. WC, %	ATTERBERG LIMITS LL	PL	PI
JS-29-GT-2		19 to 24'	Clayey Gravel, brown	GC				

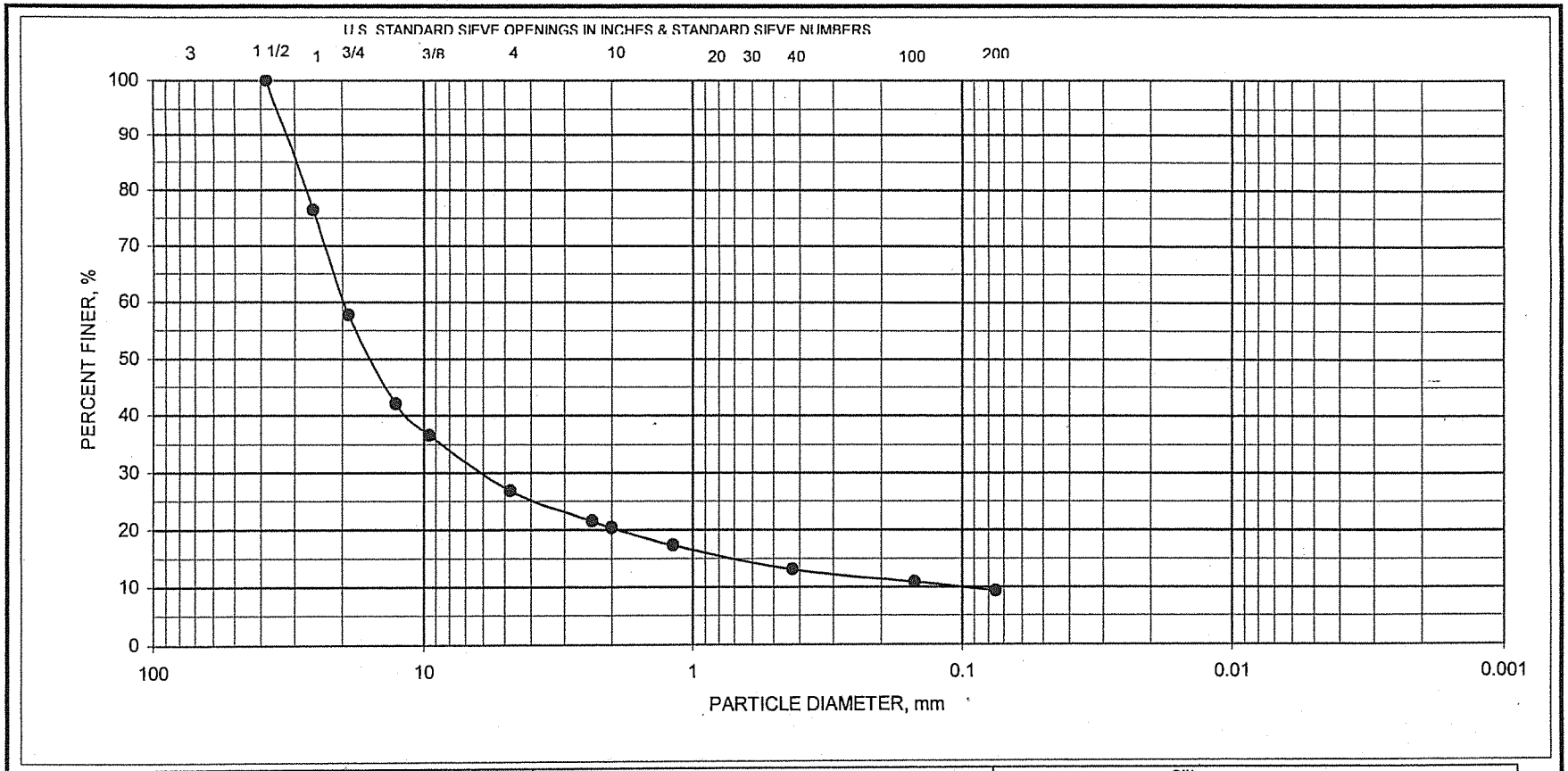
PROJECT KPRG Laboratory Testing

JOB NO. 58055075 DATE 8/25/2005

Terracon

Sieve JS-29-GT-2.xls

Electronic Filing: Received, Clerk's Office 10/31/2022



GRAVEL		Sand			Silt or Clay
Coarse	Fine	Coarse	Medium	Fine	

GRAIN SIZE DISTRIBUTION CURVE

BORING NO.	SAMPLE NO.	DEPTH, feet	ASTM DESCRIPTION	UNIFIED SYMBOL	NAT. WC, %	ATTERBERG LIMITS LL	PL	PI
JS-29-GT-3		19-24'	Poorly graded gravel with clay and sand, gray	GP-GC				

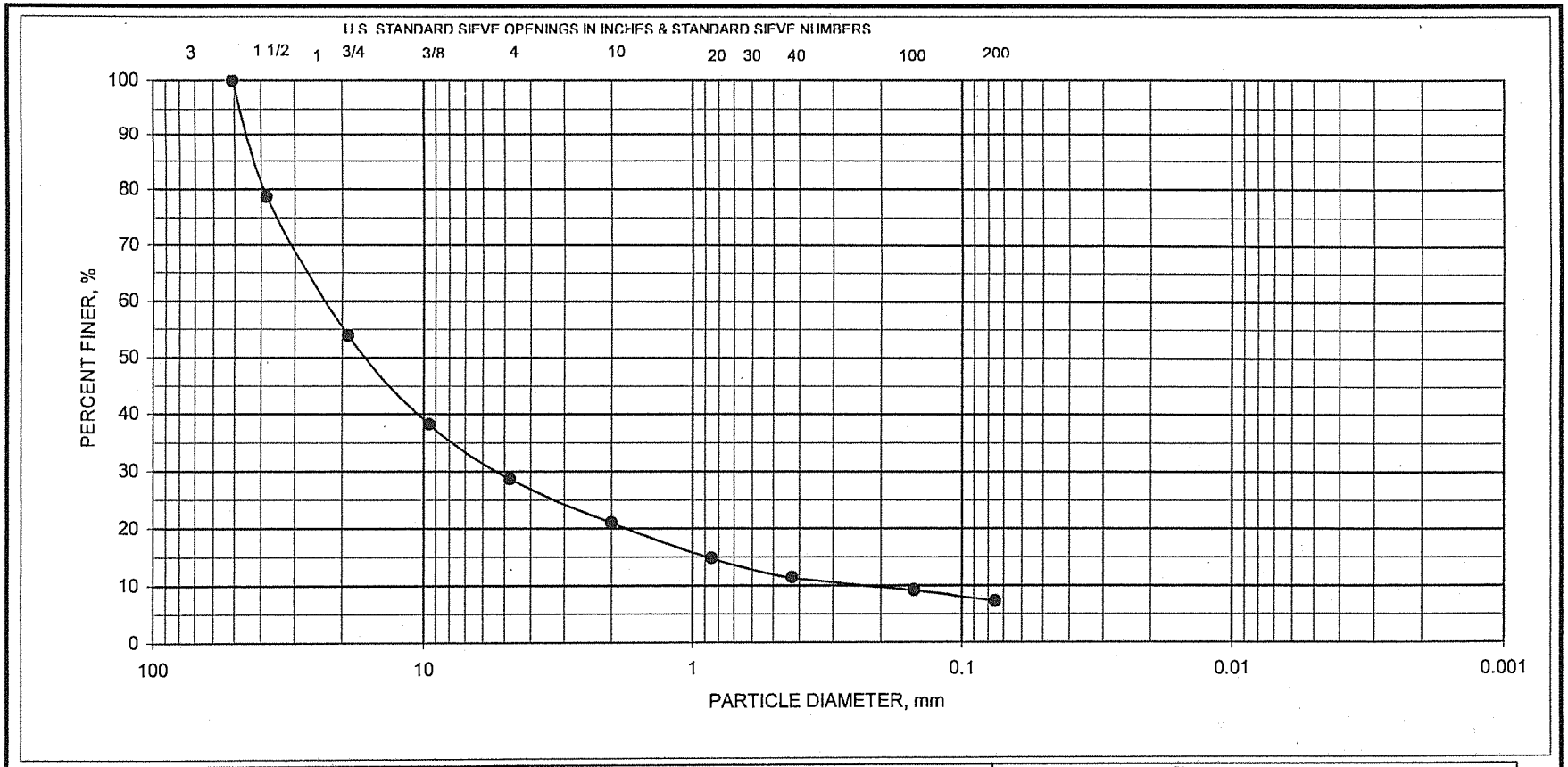
PROJECT KPRG Laboratory Testing

JOB NO. 58055075 DATE 8/25/2005

Terracon

Grad JS-29-GT-3.xls

Electronic Filing: Received, Clerk's Office 10/31/2022



GRAVEL		Sand			Silt or Clay
Coarse	Fine	Coarse	Medium	Fine	

GRAIN SIZE DISTRIBUTION CURVE

BORING NO.	SAMPLE NO.	DEPTH, feet	ASTM DESCRIPTION	UNIFIED SYMBOL	NAT. WC, %	ATTERBERG LIMITS LL	PL	PI
JS29GT-4		17 to 22'	Dolomitic Limestone With Fine To Coarse Sand	GP				

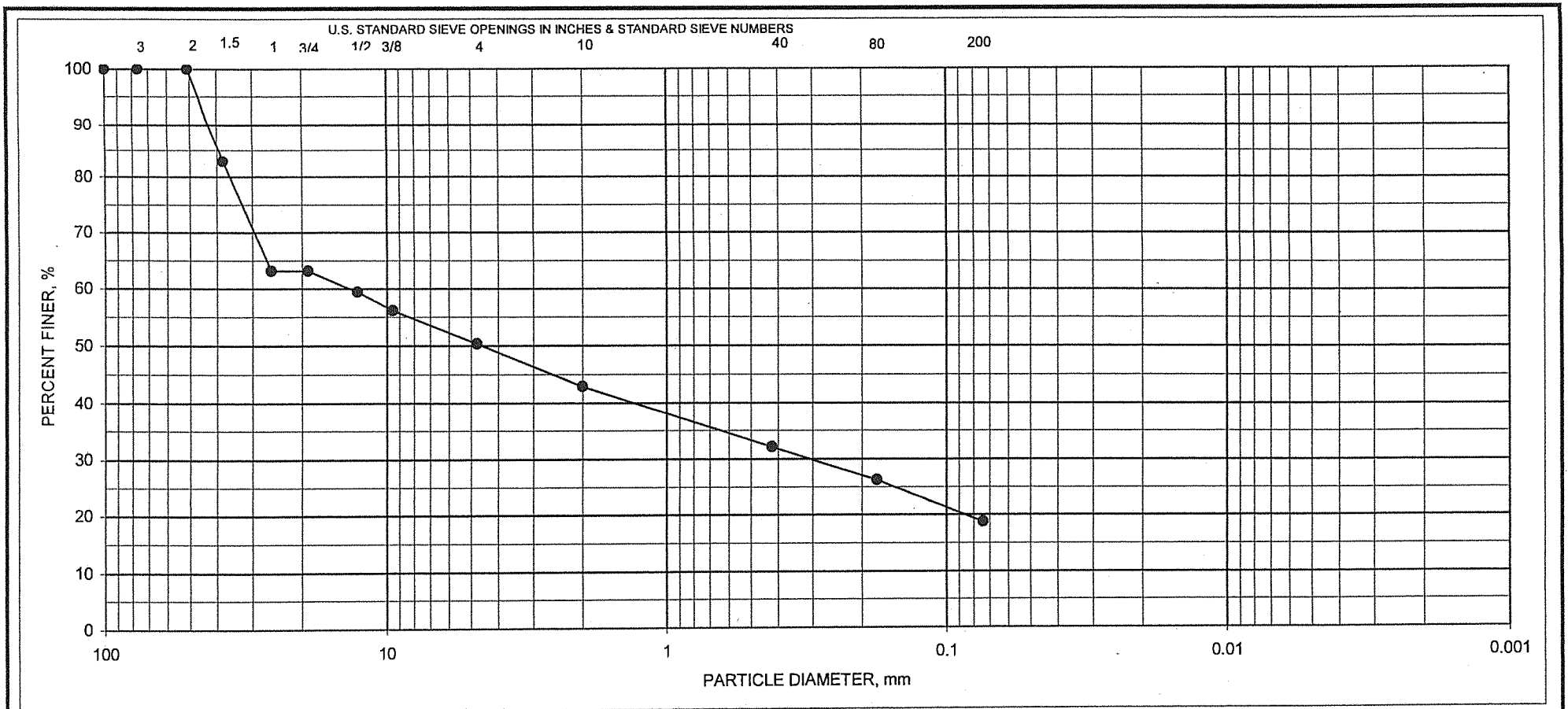
PROJECT KPRG Laboratory Testing

JOB NO. 58055075 DATE 10/6/2005

Terracon

Sieve JS29GT-4.xls

Electronic Filing: Received, Clerk's Office 10/31/2022



GRAVEL		Sand			Silt or Clay
Coarse	Fine	Coarse	Medium	Fine	

GRAIN SIZE DISTRIBUTION CURVE

BORING NO.	SAMPLE NO.	DEPTH, feet	ASTM DESCRIPTION	UNIFIED SYMBOL	NAT. WC, %	ATTERBERG LIMITS LL	PL	PI
JS 29-GT-5	TOP 8"	5.0 TO 9.0	CLAYEY GRAVEL WITH SAND, DARK GRAY WITH YELLOWISH BROWN	GC	26.0	34	23	11

PROJECT KPRG LABORATORY TESTING

JOB NO. 58055075 DATE 10/7/2005

Terracon

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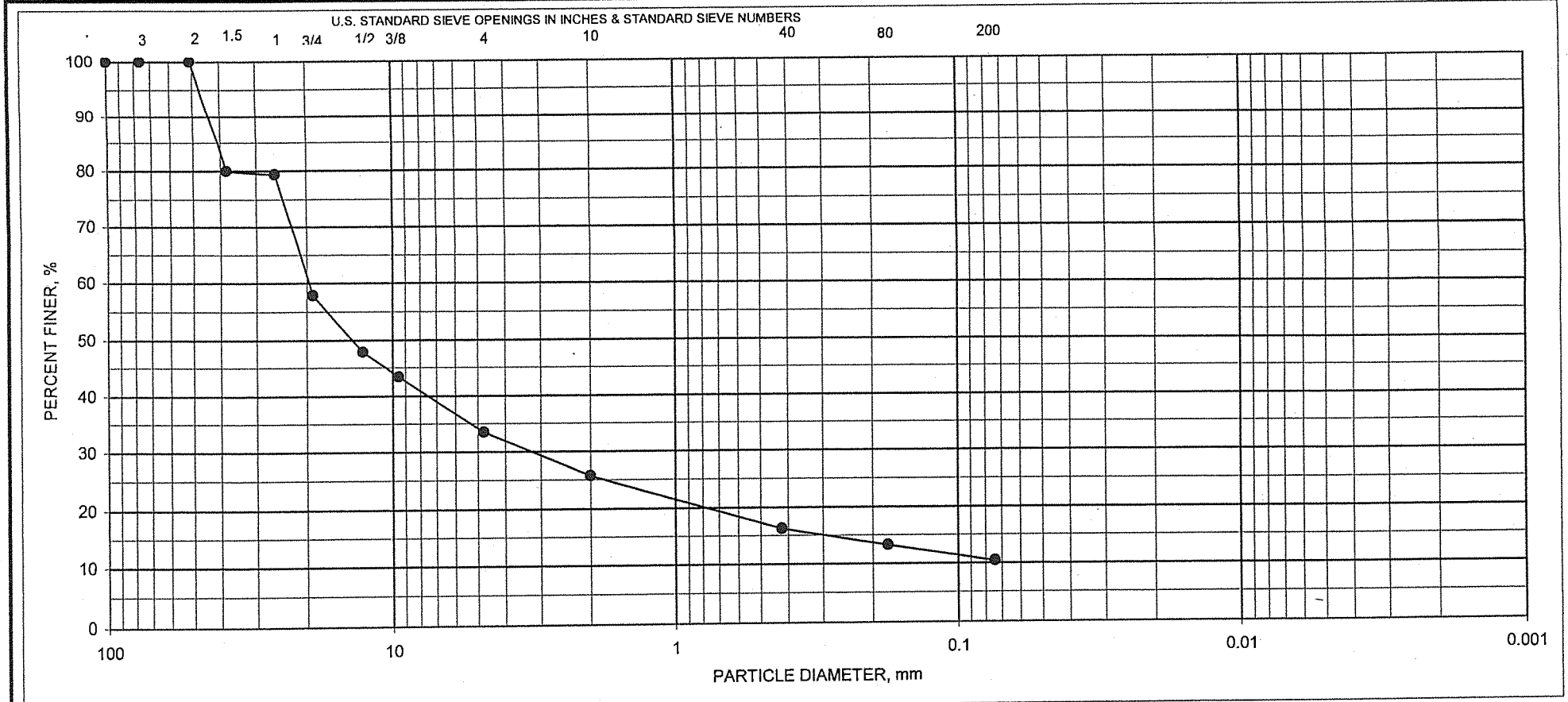


GRAVEL		Sand			Silt or Clay
Coarse	Fine	Coarse	Medium	Fine	

GRAIN SIZE DISTRIBUTION CURVE

BORING NO.	SAMPLE NO.	DEPTH, feet	ASTM DESCRIPTION	UNIFIED SYMBOL	NAT. WC, %	ATTERBERG LIMITS LL	PL	PI
JS 29-GT-5	TOP 7"	9.0 TO 14.0	POORLY GRADED GRAVEL WITH SILT & SAND, DARK GRAY	GP-GM	8.5			

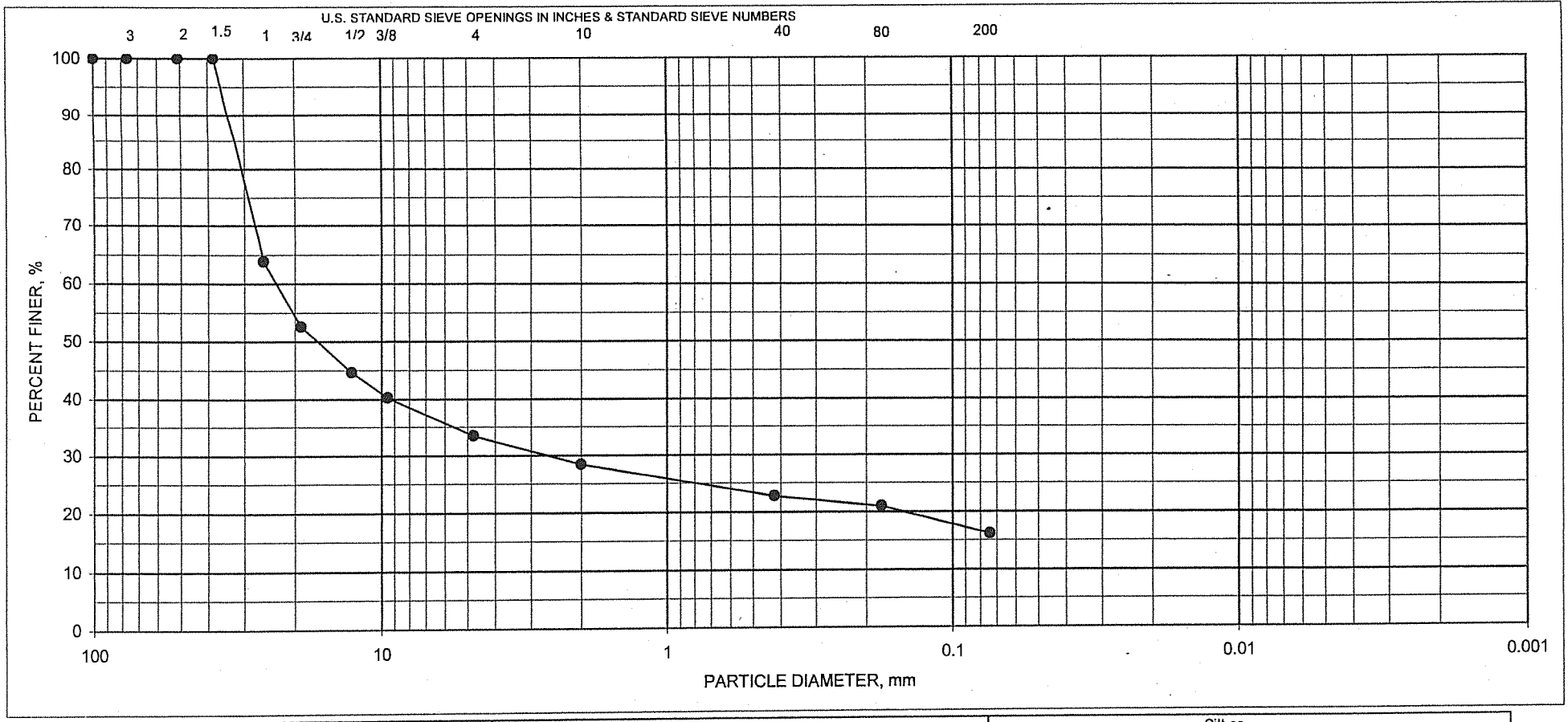
PROJECT KPRG LABORATORY TESTING

JOB NO. 58055075 DATE 10/7/2005

Terracon

C:\Documents and Settings\takauffeld\Local Settings\Temporary Internet Files\OLK16\[58055075GradationPlot-JS29-GT5-9-A.xls]REPORT

Electronic Filing: Received, Clerk's Office 10/31/2022



GRAVEL		Sand			Silt or Clay
Coarse	Fine	Coarse	Medium	Fine	

GRAIN SIZE DISTRIBUTION CURVE

BORING NO.	SAMPLE NO.	DEPTH, feet	ASTM DESCRIPTION	UNIFIED SYMBOL	NAT. WC, %	ATTERBERG LIMITS LL	PL	PI
JS 29-GT-5	BOTTOM 10"	9.0 TO 14.0	SILTY GRAVEL WITH SAND, DARK GRAY	GM	8.9	21	21	NP

PROJECT KPRG LABORATORY TESTING

JOB NO. 58055075 DATE 10/7/2005

Terracon

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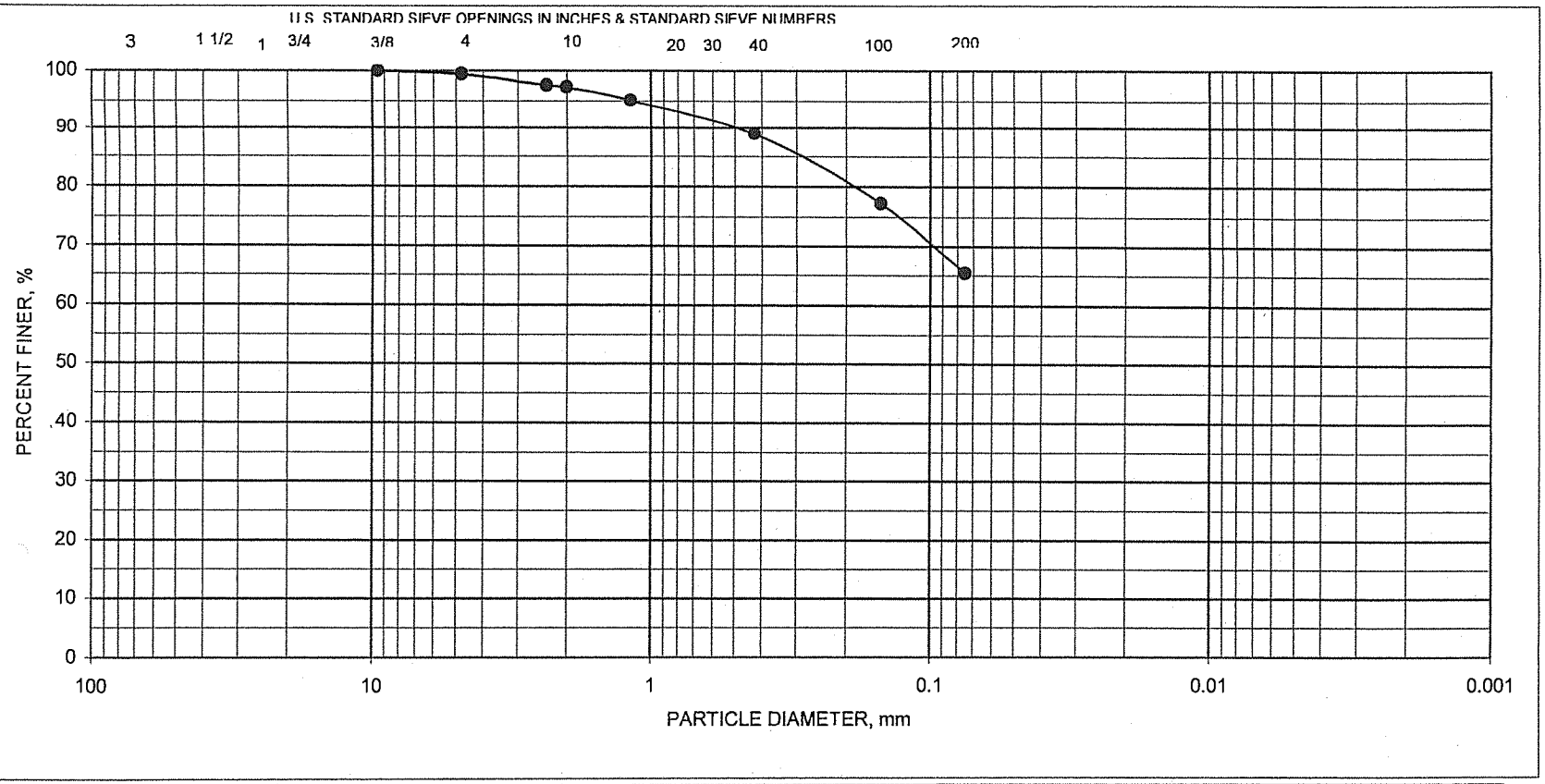

GRAVEL		Sand			Silt or Clay
Coarse	Fine	Coarse	Medium	Fine	

GRAIN SIZE DISTRIBUTION CURVE

BORING NO.	SAMPLE NO.	DEPTH, feet	ASTM DESCRIPTION	UNIFIED SYMBOL	NAT. WC, %	ATTERBERG LIMITS LL	PL	PI
JS-29-GT-6		11 to 14'	Organic Silt, dark gray, black	OH				

PROJECT KPRG Laboratory Testing

JOB NO. 58055075 DATE 8/25/2005

Terracon

Sieve JS-29-GT-6.xls

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Exhibit

48

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ILLINOIS ENVIRONMENTAL PROTECTION AGENCY

1021 NORTH GRAND AVENUE EAST, P.O. BOX 19276, SPRINGFIELD, ILLINOIS 62794-9276 • (217) 782-3397

BRUCE RAUNER, GOVERNOR ALEC MESSINA, DIRECTOR

217/782-0610

April 10, 2017

MAJOR

Midwest Generation, LLC
401 East Greenwood Ave.
Waukegan, IL 60087

Re: Waukegan Generating Station
NPDES Permit No. IL0002259
Modification of NPDES Permit (After Public Notice)

Gentlemen:

The Illinois Environmental Protection Agency has examined the request for modification of the above-referenced NPDES Permit as stated in your letter of September 30, 2013. Our final determination is to modify the permit as follows:

1. Trona Mill Wash was added as subwastestream 7 at outfall D01.
2. In special condition 16 the minimum reporting limit for chloride was changed from 0.1 mg/l to 1.0 mg/l and sulfate was changed from 0.1 mg/l to 10 mg/l to be consistent with the minimum reporting limits used at the IEPA lab.
3. Removal of Ion Exchange discharges and replacement with RO discharges tributary to outfall B01.
4. Special Condition 6 was revised to reflect the new electronic reporting rule.

Enclosed is a copy of the modified Permit. You have the right to appeal any condition of the Permit to the Illinois Pollution Control Board within a 35 day period following the issuance date.

Should you have questions concerning the Permit, please contact Jaime Rabins at 217/782-0610.

Sincerely,

Alan Keller

Alan Keller, P.E.
Manager, Permit Section
Division of Water Pollution Control

SAK:JAR:15042301

Attachments: Modified Permit

cc: Records Unit
Des Plaines FOS
Compliance Assurance Section
Billing
CMAP
US EPA

IEPA - DIVISION OF RECORDS MANAGEMENT
RELEASABLE

JUL 14 2017

REVIEWER: MED

4302 N. Main St., Rockford, IL 61103 (815) 987-7760
9511 Harrison St., Des Plaines, IL 60016 (847) 294-4000
595 S. State, Elgin, IL 60123 (847) 608-3131
2125 S. First St., Champaign, IL 61820 (217) 278-5800
2009 Mall St., Collinsville, IL 62234 (618) 346-5120
412 SW Washington St., Suite D, Peoria, IL 61602 (309) 671-3022
2309 W. Main St., Suite 116, Marion, IL 62959 (618) 993-7200
100 W. Randolph, Suite 10-300, Chicago, IL 60601

PLEASE PRINT ON RECYCLED PAPER

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MAJOR

NPDES Permit No. IL0002259

Illinois Environmental Protection Agency

Division of Water Pollution Control

1021 North Grand Avenue East

Post Office Box 19276

Springfield, Illinois 62794-9276

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM

Modified (NPDES) Permit

Expiration Date: March 31, 2020

Issue Date: March 25, 2015
Modification Date: April 10, 2017

Name and Address of Permittee:

Midwest Generation, LLC
401 East Greenwood Ave.
Waukegan, IL 60087

Facility Name and Address:

Midwest Generation, LLC
Waukegan Generating Station
401 East Greenwood Ave.
Waukegan, Illinois 60087
(Lake County)

Discharge Number and Name:

001 Condenser Cooling Water and House Service Water
A01 Boiler Blowdown
B01 Reverse Osmosis Wastes
C01 Wastewater Treatment System
D01 East Yard Collection Basin Overflow
F01 Unit 7 Demineralized Water Storage Tank Drain
G01 Non-Chemical Metal Cleaning Wastes

Receiving Waters:

Lake Michigan

In compliance with the provisions of the Illinois Environmental Protection Act, Title 35 of Ill. Adm. Code, Subtitle C and/or Subtitle D, Chapter 1, and the Clean Water Act (CWA), the above-named permittee is hereby authorized to discharge at the above location to the above-named receiving stream in accordance with the standard conditions and attachments herein.

Permittee is not authorized to discharge after the above expiration date. In order to receive authorization to discharge beyond the expiration date, the permittee shall submit the proper application as required by the Illinois Environmental Protection Agency (IEPA) not later than 180 days prior to the expiration date.

Alan Keller

Alan Keller, P.E.
Manager, Permit Section
Division of Water Pollution Control

SAK:JAR:15042301

Electronic Filing: Received, Clerk's Office 10/31/2022

Modification Date: April 10, 2017

NPDES Permit No. IL0002259

Effluent Limitations and Monitoring

From the modification date of this permit until the expiration date, the effluent of the following discharge(s) shall be monitored and limited at all times as follows:

PARAMETER	LOAD LIMITS lbs/day DAF (DMF) 30 DAY AVERAGE	LOAD LIMITS lbs/day DAF (DMF) DAILY MAXIMUM	CONCENTRATION LIMITS mg/l 30 DAY AVERAGE	CONCENTRATION LIMITS mg/l DAILY MAXIMUM	SAMPLE FREQUENCY	SAMPLE TYPE

Outfall 001: Condenser Cooling Water and House Service Water (DAF = 739 MGD)

This discharge consists of:

1. Condenser cooling water — 589 MGD
2. House service water — 29.7 MGD
3. Boiler blowdown — Intermittent
4. Reverse osmosis wastes — 0.06 MGD
5. Wastewater treatment system effluent — 8.13 MGD
6. East yard runoff basin overflow/discharge — 0.676 MGD
7. Demineralized water (storage tank drainage and steam relief) — Intermittent
8. Intake screen backwash — 0.172 MGD

Flow (MGD)	See Special Condition 1		Daily	Continuous
pH	See Special Condition 2		Weekly	Grab
Total Residual Chlorine	See Special Condition 3	0.05	*	Grab
Temperature	See Special Condition 4		Daily	Continuous
Heat Rejection Rate		5301 million BTU's per hour	Daily	Continuous

The monthly maximum temperature and the monthly maximum BTU's per hour shall be reported on the DMR under temperature and heat rejection rate, respectively.

*Total Residual Chlorine shall be sampled whenever chlorination or biocide addition is being performed or residuals are likely to be present in the discharge. If chlorination and biocide addition are not used during the month it shall be so indicated on the DMR.

Electronic Filing: Received, Clerk's Office 10/31/2022

Modification Date: April 10, 2017

NPDES Permit No. IL0002259

Effluent Limitations and Monitoring

From the modification date of this permit until the expiration date, the effluent of the following discharge(s) shall be monitored and limited at all times as follows:

PARAMETER	LOAD LIMITS lbs/day DAF (DMF) 30 DAY AVERAGE	LOAD LIMITS lbs/day DAF (DMF) DAILY MAXIMUM	CONCENTRATION LIMITS mg/l 30 DAY AVERAGE	CONCENTRATION LIMITS mg/l DAILY MAXIMUM	SAMPLE FREQUENCY	SAMPLE TYPE
Outfall A01: Boiler Blowdown (Intermittent Discharge)						
The discharge consists of:				Approximate Flow		
1. Boiler blowdown				0.018 MGD		
2. Boiler drains				0.018 MGD		
Flow (MGD)	See Special Condition 1				2/Month When Discharging	Calculated 24-Hour Total
Total Suspended Solids			15	30	2/Month When Discharging	8-Hour Composite
Oil and Grease			15	20	2/Month When Discharging	Grab

Electronic Filing: Received, Clerk's Office 10/31/2022

Modification Date: April 10, 2017

NPDES Permit No. IL0002259

Effluent Limitations and Monitoring

From the modification date of this permit until the expiration date, the effluent of the following discharge(s) shall be monitored and limited at all times as follows:

PARAMETER	LOAD LIMITS lbs/day DAF (DMF) 30 DAY AVERAGE	LOAD LIMITS lbs/day DAF (DMF) DAILY MAXIMUM	CONCENTRATION LIMITS mg/l 30 DAY AVERAGE	CONCENTRATION LIMITS mg/l DAILY MAXIMUM	SAMPLE FREQUENCY	SAMPLE TYPE
Outfall B01: Reverse Osmosis Wastes (DAF = 0.06 MGD)						
The discharge consists of:				Approximate Flow		
1. Reverse Osmosis Reject				65 gpm		
2. Reverse Osmosis Regeneration				450 gallons/cleaning		
Flow (MGD)	See Special Condition 1				2/Month	24-Hour Total
Total Suspended Solids			15	30	2/Month	8-Hour Composite
Oil and Grease			15	20	2/Month	Grab

Total Suspended Solids and Oil and Grease sampling may obtained using a Grab Sample if the equalization tank is in service.

Electronic Filing: Received, Clerk's Office 10/31/2022

NPDES Permit No. IL0002259

Effluent Limitations and Monitoring

From the modification date of this permit until the expiration date, the effluent of the following discharge(s) shall be monitored and limited at all times as follows:

PARAMETER	LOAD LIMITS lbs/day DAF (DMF) 30 DAY AVERAGE	LOAD LIMITS lbs/day DAF (DMF) DAILY MAXIMUM	CONCENTRATION LIMITS mg/l 30 DAY AVERAGE	CONCENTRATION LIMITS mg/l DAILY MAXIMUM	SAMPLE FREQUENCY	SAMPLE TYPE
Outfall C01: Wastewater Treatment System (DAF = 8.13 MGD)						
This Discharge consists of:				Approximate Flow		
1. Bottom Ash Sluice				1.6 MGD		
2. Ash hopper overflow				Intermittent		
3. Coal pile runoff collection basin discharge				1.0 MGD		
a. Coal pile area runoff				0.5 MGD		
b. West yard area runoff				0.5 MGD		
i. West yard area runoff						
ii. Car dumper area runoff						
iii. Main switch yard area runoff						
iv. West yard polymer building drains						
v. Peaker sump discharges						
vi. West turbine area roof drains						
4. Non-chemical metal cleaning waste				Intermittent		
5. Supernatant from dredge spoil lagoons				Intermittent		
6. Main collection tank discharge				2.0 MGD		
a. Unit 8 low point sump (roof, floor, & equipment drains)				Intermittent		
b. Ash sluice head tank overflow				Intermittent		
c. Slag drain line				Intermittent		
d. Slag tank overflows				Intermittent		
e. RO filter backwash (alternate route)				Intermittent		
f. Floor drains (alternate route)				Intermittent		
Flow (MGD)	See Special Condition 1				Daily	Continuous
Total Suspended Solids			15	30	2/Month	24-Hour Composite
Oil and Grease			15	20	2/Month	Grab

Electronic Filing: Received, Clerk's Office 10/31/2022

Modification Date: April 10, 2017

NPDES Permit No. IL0002259

Effluent Limitations and Monitoring

From the modification date of this permit until the expiration date, the effluent of the following discharge(s) shall be monitored and limited at all times as follows:

PARAMETER	LOAD LIMITS lbs/day DAF (DMF) 30 DAY AVERAGE	LOAD LIMITS lbs/day DAF (DMF) DAILY MAXIMUM	CONCENTRATION LIMITS mg/l 30 DAY AVERAGE	CONCENTRATION LIMITS mg/l DAILY MAXIMUM	SAMPLE FREQUENCY	SAMPLE TYPE
Outfall D01: East Yard Collection Basin Overflow (DAF = 0.676 MGD)						
This discharge consists of:				Approximate Flow		
1. East yard area runoff				Intermittent		
2. Units 1-4 roof and floor drainage				Intermittent		
3. East yard polymer building drains				Intermittent		
4. RO filter backwash				0.078 MGD		
5. Laboratory sink drains				Intermittent		
6. Units 5-8 roof and floor drains				Intermittent		
7. Trona Mill Wash				800 gpd		
Flow (MGD)	See Special Condition 1				1/Week	24-Hour Total
Total Suspended Solids			15	30	2/Month	24-Hour Composite
Oil and Grease			15	20	2/Month	Grab

Electronic Filing: Received, Clerk's Office 10/31/2022

Modification Date: April 10, 2017

NPDES Permit No. IL0002259

Effluent Limitations and Monitoring

From the modification date of this permit until the expiration date, the effluent of the following discharge(s) shall be monitored and limited at all times as follows:

PARAMETER	LOAD LIMITS lbs/day DAF (DMF) 30 DAY AVERAGE	LOAD LIMITS lbs/day DAF (DMF) DAILY MAXIMUM	CONCENTRATION LIMITS mg/l 30 DAY AVERAGE	CONCENTRATION LIMITS mg/l DAILY MAXIMUM	SAMPLE FREQUENCY	SAMPLE TYPE
Outfall F01: Unit 7 Demineralized Water Storage Tank Drain(Intermittent Discharge)						
Flow (MGD)	See Special Condition 1				1/Week When Discharging	Estimate
Total Suspended Solids			15	30	1/Week When Discharging	Grab
Oil and Grease			15	20	1/Week When Discharging	Grab

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Modification Date: April 10, 2017

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Outfall G01: Non-Chemical Metal Cleaning Wastes (DAF = Intermittent Discharge)						
Flow (MGD)	See Special Condition 1				Daily When Discharging	Continuous
Total Suspended Solids			30	100	Daily When Discharging	24-Hour Composite
Oil and Grease			15	20	Daily When Discharging	Grab
Iron			1.0	1.0	Daily When Discharging	24-Hour Composite
Copper			1.0	1.0	Daily When Discharging	24-Hour Composite

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Special Conditions

SPECIAL CONDITION 1. Flow shall be measured in units of Million Gallons per Day (MGD) and reported as a monthly average and a daily maximum value on the monthly Discharge Monitoring Report.

SPECIAL CONDITION 2. The pH shall be in the range 7.0 to 9.0. The monthly minimum and monthly maximum values shall be reported on the DMR form.

The permittee shall achieve compliance with the above pH limitation at outfall 001 as soon as possible but not later than 18 months from the effective date of this permit in accordance with the following schedule:

	ITEM	COMPLETION DATE
1.	Initial Report	6 Months from the Effective Date
2.	Interim Report	12 Months from the Effective Date
3.	Final Report and Compliance	18 Months from the Effective Date

From the effective date of the permit, pH shall be monitored at outfall 001 weekly as specified on page 2 of the permit. The initial report shall include a summary of this data and a determination of whether or not additional treatment is necessary to achieve and maintain compliance with the applicable pH limit. If additional treatment is determined not to be necessary, compliance with the applicable pH limit is required 6 months from the effective date of this permit. All reports shall be submitted to the IEPA at the address in special condition 6.

SPECIAL CONDITION 3. All samples for total residual chlorine (TRC) shall be analyzed by an applicable method contained in 40 CFR 136, equivalent in accuracy to low-level amperometric titration. Any analytical variability of the method used shall be considered when determining the accuracy and precision of the results obtained.

SPECIAL CONDITION 4. Pursuant to Illinois Pollution Control Board Order 77-82, dated August 3, 1978 the discharge is limited to a heat rejection rate of 5301 million BTU's per hour in lieu of the standards of 35 Ill. Adm. Code 302.507. The Permittee's demonstration for the Waukegan Generating Station in accordance with Section 316(a) of the CWA was approved by the Illinois Pollution Control Board in Order PCB 78-72, -73 Consolidated dated September 21, 1978.

Compliance with this part shall be determined on a continuous basis by the following equation:

$$H = 0.0005 Q_{CW} (T_{CW} - T_{US})$$

H Heat Rejection Rate in million BTU's per hour.

T_{CW} Actual condenser cooling water discharge temperature in degrees Fahrenheit from continuous temperature monitor located at the condenser outlet waterbox.

Q_{CW} Condenser cooling water flow in gallons per minute based on the number of circulating water pumps on at the time in question. Each of Unit 7's four circulating water pumps is rated at 64,000 gpm and each of Unit 8's two circulating water pumps is rated at 110,000 gpm.

T_{US} Intake cooling water temperature in degrees Fahrenheit from the continuous temperature monitor located at the condenser inlet waterbox.

As a condition of the continuation of the facility's 316(a) thermal variance (PCB 72-73 Consolidated, dated September 21, 1978), the permittee shall conduct the following activities and studies:

1. Within six months of the permit issuance date:

   a. Complete a literature search for biological studies conducted in Lake Michigan in the general vicinity of the facility, including but not limited to, relevant biological monitoring data from state or federal agencies.
   b. Prepare a Representative Important Species (RIS) List, including an explanation of the rationale for selection of each species on the list; and
   c. Based on the results of the biological studies literature search and the RIS List, prepare a study plan for biological sampling and thermal monitoring, including as appropriate thermal modeling. The study plan shall be submitted to the Agency for approval prior to initiation. The study plan shall include the RIS List. The permittee shall also send a copy of the study plan and RIS List to the U.S. EPA Region 5 to provide it with an opportunity to review and comment on the study plan prior to commencement of the study.

2. Upon the Agency's approval of the study plan for biological and thermal monitoring, perform thermal plume surveys on the facility's discharge and any appropriate thermal model development and field verification within eighteen months of the receipt of the Agency's approval. In the event that the Agency's approval of the study plan is not received within nine months of the permit issuance date, the permittee may proceed to implement the study plan pending receipt of the Agency's approval.

3. Based on the information obtained from thermal plume surveys, the permittee shall finalize the specific sampling locations for,

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and conduct, the biological monitoring study plan.

If the permittee intends to request the continuation of the 316(a) thermal variance in its renewed NPDES permit, the permittee shall submit to the Agency a report containing the results of the biological and thermal monitoring, including any applicable thermal modeling, and any other information necessary to comply with 35 Ill. Adm. Code 106.1180 concurrent with its next NPDES permit renewal application.

Alternately, the Permittee may demonstrate to the Agency that alternate thermal standards of PCB 77-82, or other site specific water quality standards for temperature approved by the Illinois Pollution Control Board, and USEPA, meets the requirements of 40 CFR 131 and the Illinois Environmental Protection Act.

SPECIAL CONDITION 5. Samples taken in compliance with the effluent monitoring requirements shall be taken at a point representative of the discharge, but prior to entry into the receiving stream.

SPECIAL CONDITION 6. The Permittee shall record monitoring results on Discharge Monitoring Report (DMR) Forms using one such form for each outfall each month.

In the event that an outfall does not discharge during a monthly reporting period, the DMR Form shall be submitted with no discharge indicated.

The Permittee will be required to submit electronic DMRs (NetDMRs) instead of mailing paper DMRs to the IEPA beginning December 21, 2016 unless a waiver has been granted by the Agency. More information, including registration information for the NetDMR program, can be obtained on the IEPA website, http://www.epa.state.il.us/water/net-dmr/index.html.

The completed Discharge Monitoring Report forms shall be submitted to IEPA no later than the 28th day of the following month, unless otherwise specified by the permitting authority.

Permittees that have been granted a waiver shall mail Discharge Monitoring Reports with an original signature to the IEPA at the following address:

Illinois Environmental Protection Agency
Division of Water Pollution Control
Attention: Compliance Assurance Section, Mail Code # 19
1021 North Grand Avenue East
Post Office Box 19276
Springfield, Illinois 62794-9276

SPECIAL CONDITION 7. Cooling Water Intake Structure. Based on available information, the Agency has determined that the operation of the cooling water intake structure meets the equivalent of Best Technology Available (BTA) in accordance with the Best Professional Judgment provisions of 40 CFR 125.3 and 40 CFR 125.90(b), based on information available at the time of permit reissuance.

However, the Permittee shall comply with the requirements of the Cooling Water Intake Structure Existing Facilities Rule as found at 40 CFR 122 and 125. Any application materials and submissions required for compliance with the Existing Facilities Rule, shall be submitted to the Agency no later than 4 years from the effective date of this permit.

If for any reason, the Cooling Water Intake Structure Existing Facilities Rule is stayed or remanded by the courts, the Permittee shall comply with the requirements below. The information required below is necessary to further evaluate cooling water intake structure operations based on the most up to date information, in accordance with the Best Professional Judgment provisions of 40 CFR 125.3 and 40 CFR 125.90(b), in existence prior to the effective date of the new Existing Facilities Rule:

A. The permittee shall submit the following information/studies within 4 years of the effective date of the permit:

1. Source Water Physical Data to include:

   a. A narrative description and scaled drawings showing the physical configuration of all source water bodies used by the facility including aerial dimensions, depths, salinity and temperature regimes;

   b. Identification and characterization of the source waterbody's hydrological and geomorphological features, as well as the methods used to conduct any physical studies to determine the intake's area of influence and the results of such studies; and

   c. Location maps.

2. Source Waterbody Flow Information

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The permittee shall provide the annual mean flow of the waterbody, any supporting documentation and engineering calculations to support the analysis of whether the design intake flow is greater than five percent of the mean annual flow of the river or stream for purposes of determining applicable performance standards. Representative historical data (from a period of time up to 10 years) shall be used, if available.

3. Impingement Mortality and Entrainment Characterization Study

The permittee shall submit an Impingement Mortality and Entrainment Characterization Study whose purpose is to provide information to support the development of a calculation baseline for evaluating impingement mortality and entrainment and to characterize current impingement mortality and entrainment. The Study shall include the following in sufficient detail to support establishment of baseline conditions:

a. Taxonomic identification of all life stages of fish and shellfish and any species protected under Federal, State, or Tribal law (including threatened or endangered species) that are in the vicinity of the cooling water intake structure(s) and are susceptible to impingement and entrainment;

b. A characterization of all life stages of fish and shellfish, and any species protected under Federal, or State law, including a description of the abundance and temporal and spatial characteristics in the vicinity of the cooling water intake structure(s). These may include historical data that are representative of the current operation of the facility and of biological conditions at the site; and

c. Documentation of the current impingement mortality and entrainment of all life stages of fish, shellfish, and any species protected under Federal , State, or Tribal Law (including threatened or endangered species) and an estimate of impingement mortality and entrainment to be used as the calculation baseline. The documentation may include historical data that are representative of the current operation of the facility and of biological conditions at the site. Impingement mortality and entrainment samples to support the calculations required must be collected during periods of representative operational flows for the cooling water intake structure and the flows associated with the samples must be documented.

B. The permittee shall comply with the following requirements:

1. At all times properly operate and maintain the intake equipment as demonstrated in the application material supporting the BTA determination.

2. Inform IEPA of any proposed changes to the cooling water intake structure or proposed changes to operations at the facility that affect impingement mortality and/or entrainment.

3. Debris collected on intake screens is prohibited from being discharged back to the canal. Debris does not include living fish or other living aquatic organisms.

4. Compliance Alternatives. The permittee must evaluate each of the following alternatives for establishing best available technology for minimizing adverse environmental impacts at the facility due to operation of the intake structure:

a. Evaluate operational procedures and/or propose facility modifications to reduce the intake through-screen velocity to less than 0.5 ft/sec. The operational evaluation may consider modified circulating water pump operation; reduced flow associated with capacity utilization, recalculation or determination of actual total water withdrawal capacity. The evaluation report and any implementation plan for the operational changes and/ or facility modification shall be submitted to the Agency with the renewal application for this permit.

b. Complete a fish impingement and entrainment mortality minimization alternatives evaluation. The evaluation may include an assessment of modification of the traveling screens, consideration of a separate fish and debris return system and include time frames and cost analysis to implement these measures. The evaluation report and implementation plan for any operational changes and/ or facility modifications shall be submitted to the Agency with the renewal application for this permit.

C. All required reports shall be submitted to the Industrial Unit, Permit Section and Compliance Assurance Section at the address in special condition 6.

This special condition does not relieve the permittee of the responsibility of complying with any other laws, regulations, or judicial orders issued pursuant to Section 316(b) of the Clean Water Act.

SPECIAL CONDITION 8. If an applicable effluent standard or limitation is promulgated under Sections 301(b)(2)(C) and (D), 304(b)(2), and 307(a)(2) of the Clean Water Act and that effluent standard or limitation is more stringent than any effluent limitation in the permit or

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controls a pollutant not limited in the NPDES Permit, the Agency shall revise or modify the permit in accordance with the more stringent standard or prohibition and shall so notify the permittee.

SPECIAL CONDITION 9. The use or operation of this facility shall be by or under the supervision of a Certified Class K operator.

SPECIAL CONDITION 10. In the event that the permittee shall require changes in the use of water treatment additives, the permittee must request a change in this permit in accordance with the Standard Conditions -- Attachment H.

SPECIAL CONDITION 11. The cooling water prior to entering the intake structure and at outfall 001 shall be sampled once per week as a grab sample at the same time of day within ½ hour of each other between 9:00 a.m. and 3:00 p.m. in a random fashion for dissolved oxygen. The results in mg/l and the time of day the influent and effluent sample was taken shall be reported to the Agency as an attachment to the DMR. After 2 years of data has been submitted to the Agency, the permittee may apply to Agency to have the monitoring reduced or eliminated.

SPECIAL CONDITION 12. There shall be no discharge of polychlorinated biphenyl compounds.

SPECIAL CONDITION 13. The bypass provisions of 40 CFR 122.41(m) and upset provisions of 40 CFR 122.41(n) are hereby incorporated by reference.

SPECIAL CONDITION 14. The Agency has determined that the effluent limitations for outfall 001 constitute BAT/BCT for storm water which is treated in the existing treatment facilities for purposes of this permit reissuance, and no pollution prevention plan will be required for such storm water. In addition to the chemical specific monitoring required elsewhere in this permit, the permittee shall conduct an annual inspection of the facility site to identify areas contributing to a storm water discharge associated with industrial activity, and determine whether any facility modifications have occurred which result in previously-treated storm water discharges no longer receiving treatment. If any such discharges are identified the permittee shall request a modification of this permit within 30 days after the inspection. Records of the annual inspection shall be retained by the permittee for the term of this permit and be made available to the Agency on request.

SPECIAL CONDITION 15. There shall be no discharge of complexed metal bearing wastestreams and associated rinses from chemical metal cleaning unless this permit has been modified to include the new discharge.

SPECIAL CONDITION 16. The Permittee shall monitor the effluent from outfall 001 for the following parameters on a semi-annual basis. This Permit may be modified with public notice to establish effluent limitations if appropriate, based on information obtained through sampling. The sample shall be a 24-hour effluent composite except as otherwise specifically provided below and the results shall be submitted to the address in special condition 6 in June and December. The parameters to be sampled and the minimum reporting limits to be attained are as follows:

STORET CODE	PARAMETER	Minimum reporting limit
01002	Arsenic	0.05 mg/L
01007	Barium	0.5 mg/L
01022	Boron	0.1 mg/L
01027	Cadmium	0.001 mg/L
00940	Chloride	1.0 mg/L
01032	Chromium (hexavalent) (grab)	0.01 mg/L
01034	Chromium (total)	0.05 mg/L
01042	Copper	0.005 mg/L
00718	Cyanide (grab) (available *** or amendable to chlorination))	5.0 ug/L
00720	Cyanide (grab not to exceed 24 hours) (total)	5.0 ug/L
00951	Fluoride	0.1 mg/L
01045	Iron (total)	0.5 mg/L
01046	Iron (Dissolved)	0.5 mg/L
01051	Lead	0.05 mg/L
01055	Manganese	0.5 mg/L
71900	Mercury (grab)**	1.0 ng/L*
01067	Nickel	0.005 mg/L
00556	Oil (hexane soluble or equivalent) (Grab Sample only)	5.0 mg/L
32730	Phenols (grab)	0.005 mg/L
01147	Selenium	0.005 mg/L
00945	Sulfate	10 mg/L
01077	Silver (total)	0.003 mg/L
01092	Zinc	0.025 mg/L

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Special Conditions

Unless otherwise indicated, concentrations refer to the total amount of the constituent present in all phases, whether solid, suspended or dissolved, elemental or combined, including all oxidation states.

*1.0 ng/L = 1 part per trillion.
**Utilize USEPA Method 1631E and the digestion procedure described in Section 11.1.1.2 of 1631E. Mercury shall be monitored monthly for the first two years and quarterly thereafter. This Permit may be modified with public notice to establish effluent limitations if appropriate, based on information obtained through sampling. The quarterly monitoring results shall be submitted on the March, June, September and December DMRs.
***USEPA Method OIA-1677

SPECIAL CONDITION 17. The effluent, alone or in combination with other sources, shall not cause a violation of any applicable water quality standard outlined in 35 Ill. Adm. Code 302.

Attachment H
Standard Conditions

Definitions

Act means the Illinois Environmental Protection Act, 415 ILCS 5 as Amended.

Agency means the Illinois Environmental Protection Agency.

Board means the Illinois Pollution Control Board.

Clean Water Act (formerly referred to as the Federal Water Pollution Control Act) means Pub. L 92-500, as amended. 33 U.S.C. 1251 et seq.

NPDES (National Pollutant Discharge Elimination System) means the national program for issuing, modifying, revoking and reissuing, terminating, monitoring and enforcing permits, and imposing and enforcing pretreatment requirements, under Sections 307, 402, 318 and 405 of the Clean Water Act.

USEPA means the United States Environmental Protection Agency.

Daily Discharge means the discharge of a pollutant measured during a calendar day or any 24-hour period that reasonably represents the calendar day for purposes of sampling. For pollutants with limitations expressed in units of mass, the "daily discharge" is calculated as the total mass of the pollutant discharged over the day. For pollutants with limitations expressed in other units of measurements, the "daily discharge" is calculated as the average measurement of the pollutant over the day.

Maximum Daily Discharge Limitation (daily maximum) means the highest allowable daily discharge.

Average Monthly Discharge Limitation (30 day average) means the highest allowable average of daily discharges over a calendar month, calculated as the sum of all daily discharges measured during a calendar month divided by the number of daily discharges measured during that month.

Average Weekly Discharge Limitation (7 day average) means the highest allowable average of daily discharges over a calendar week, calculated as the sum of all daily discharges measured during a calendar week divided by the number of daily discharges measured during that week.

Best Management Practices (BMPs) means schedules of activities, prohibitions of practices, maintenance procedures, and other management practices to prevent or reduce the pollution of waters of the State. BMPs also include treatment requirements, operating procedures, and practices to control plant site runoff, spillage or leaks, sludge or waste disposal, or drainage from raw material storage.

Aliquot means a sample of specified volume used to make up a total composite sample.

Grab Sample means an individual sample of at least 100 milliliters collected at a randomly-selected time over a period not exceeding 15 minutes.

24-Hour Composite Sample means a combination of at least 8 sample aliquots of at least 100 milliliters, collected at periodic intervals during the operating hours of a facility over a 24-hour period.

8-Hour Composite Sample means a combination of at least 3 sample aliquots of at least 100 milliliters, collected at periodic intervals during the operating hours of a facility over an 8-hour period.

Flow Proportional Composite Sample means a combination of sample aliquots of at least 100 milliliters collected at periodic intervals such that either the time interval between each aliquot or the volume of each aliquot is proportional to either the stream flow at the time of sampling or the total stream flow since the collection of the previous aliquot.

(1) **Duty to comply.** The permittee must comply with all conditions of this permit. Any permit noncompliance constitutes a violation of the Act and is grounds for enforcement action, permit termination, revocation and reissuance, modification, or for denial of a permit renewal application. The permittee shall comply with effluent standards or prohibitions established under Section 307(a) of the Clean Water Act for toxic pollutants within the time provided in the regulations that establish these standards or prohibitions, even if the permit has not yet been modified to incorporate the requirements.

(2) **Duty to reapply.** If the permittee wishes to continue an activity regulated by this permit after the expiration date of this permit, the permittee must apply for and obtain a new permit. If the permittee submits a proper application as required by the Agency no later than 180 days prior to the expiration date, this permit shall continue in full force and effect until the final Agency decision on the application has been made.

(3) **Need to halt or reduce activity not a defense.** It shall not be a defense for a permittee in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this permit.

(4) **Duty to mitigate.** The permittee shall take all reasonable steps to minimize or prevent any discharge in violation of this permit which has a reasonable likelihood of adversely affecting human health or the environment.

(5) **Proper operation and maintenance.** The permittee shall at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) which are installed or used by the permittee to achieve compliance with conditions of this permit. Proper operation and maintenance includes effective performance, adequate funding, adequate operator staffing and training, and adequate laboratory and process controls, including appropriate quality assurance procedures. This provision requires the operation of back-up, or auxiliary facilities, or similar systems only when necessary to achieve compliance with the conditions of the permit.

(6) **Permit actions.** This permit may be modified, revoked and reissued, or terminated for cause by the Agency pursuant to 40 CFR 122.62 and 40 CFR 122.63. The filing of a request by the permittee for a permit modification, revocation and reissuance, or termination, or a notification of planned changes or anticipated noncompliance, does not stay any permit condition.

(7) **Property rights.** This permit does not convey any property rights of any sort, or any exclusive privilege.

(8) **Duty to provide information.** The permittee shall furnish to the Agency within a reasonable time, any information which the Agency may request to determine whether cause exists for modifying, revoking and reissuing, or terminating this permit, or to determine compliance with the permit. The permittee shall also furnish to the Agency upon request, copies of records required to be kept by this permit.

(9) **Inspection and entry.** The permittee shall allow an authorized representative of the Agency or USEPA (including an authorized contractor acting as a representative of the Agency or USEPA), upon the presentation of credentials and other documents as may be required by law, to:
  (a) Enter upon the permittee's premises where a regulated facility or activity is located or conducted, or where records must be kept under the conditions of this permit;
  (b) Have access to and copy, at reasonable times, any records that must be kept under the conditions of this permit;
  (c) Inspect at reasonable times any facilities, equipment (including monitoring and control equipment), practices, or operations regulated or required under this permit; and
  (d) Sample or monitor at reasonable times, for the purpose of assuring permit compliance, or as otherwise authorized by the Act, any substances or parameters at any location.

(10) **Monitoring and records.**
  (a) Samples and measurements taken for the purpose of monitoring shall be representative of the monitored activity.
  (b) The permittee shall retain records of all monitoring information, including all calibration and maintenance records, and all original strip chart recordings for continuous monitoring instrumentation, copies of all reports required by this permit, and records of all data used to complete the application for this permit, for a period of at least 3 years from the date of this permit, measurement, report or application. Records related to the permittee's sewage sludge use and disposal activities shall be retained for a period of at least five years (or longer as required by 40 CFR Part 503). This period may be extended by request of the Agency or USEPA at any time.
  (c) Records of monitoring information shall include:
    (1) The date, exact place, and time of sampling or measurements;
    (2) The individual(s) who performed the sampling or measurements;
    (3) The date(s) analyses were performed;
    (4) The individual(s) who performed the analyses;
    (5) The analytical techniques or methods used; and
    (6) The results of such analyses.
  (d) Monitoring must be conducted according to test procedures approved under 40 CFR Part 136, unless other test procedures have been specified in this permit. Where no test procedure under 40 CFR Part 136 has been approved, the permittee must submit to the Agency a test method for approval. The permittee shall calibrate and perform maintenance procedures on all monitoring and analytical instrumentation at intervals to ensure accuracy of measurements.

(11) **Signatory requirement.** All applications, reports or information submitted to the Agency shall be signed and certified.
  (a) **Application.** All permit applications shall be signed as follows:
    (1) For a corporation: by a principal executive officer of at least the level of vice president or a person or position having overall responsibility for environmental matters for the corporation:
    (2) For a partnership or sole proprietorship: by a general partner or the proprietor, respectively; or
    (3) For a municipality, State, Federal, or other public agency: by either a principal executive officer or ranking elected official.
  (b) **Reports.** All reports required by permits, or other information requested by the Agency shall be signed by a person described in paragraph (a) or by a duly authorized representative of that person. A person is a duly authorized representative only if:
    (1) The authorization is made in writing by a person described in paragraph (a); and
    (2) The authorization specifies either an individual or a position responsible for the overall operation of the facility, from which the discharge originates, such as a plant manager, superintendent or person of equivalent responsibility; and
    (3) The written authorization is submitted to the Agency.
  (c) **Changes of Authorization.** If an authorization under (b) is no longer accurate because a different individual or position has responsibility for the overall operation of the facility, a new authorization satisfying the requirements of (b) must be submitted to the Agency prior to or together with any reports, information, or applications to be signed by an authorized representative.
  (d) **Certification.** Any person signing a document under paragraph (a) or (b) of this section shall make the following certification:

  I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

(12) **Reporting requirements.**
  (a) **Planned changes.** The permittee shall give notice to the Agency as soon as possible of any planned physical alterations or additions to the permitted facility.
  Notice is required when:
    (1) The alteration or addition to a permitted facility may meet one of the criteria for determining whether a facility is a new source pursuant to 40 CFR 122.29 (b); or
    (2) The alteration or addition could significantly change the nature or increase the quantity of pollutants discharged. This notification applies to pollutants which are subject neither to effluent limitations in the permit, nor to notification requirements pursuant to 40 CFR 122.42 (a)(1).
    (3) The alteration or addition results in a significant change in the permittee's sludge use or disposal practices, and such alteration, addition, or change may justify the application of permit conditions that are different from or absent in the existing permit, including notification of additional use or disposal sites not reported during the permit application process or not reported pursuant to an approved land application plan.
  (b) **Anticipated noncompliance.** The permittee shall give advance notice to the Agency of any planned changes in the permitted facility or activity which may result in noncompliance with permit requirements.
  (c) **Transfers.** This permit is not transferable to any person except after notice to the Agency.
  (d) **Compliance schedules.** Reports of compliance or noncompliance with, or any progress reports on, interim and final requirements contained in any compliance schedule of this permit shall be submitted no later than 14 days following each schedule date.

(e) **Monitoring reports.** Monitoring results shall be reported at the intervals specified elsewhere in this permit.
(1) Monitoring results must be reported on a Discharge Monitoring Report (DMR).
(2) If the permittee monitors any pollutant more frequently than required by the permit, using test procedures approved under 40 CFR 136 or as specified in the permit, the results of this monitoring shall be included in the calculation and reporting of the data submitted in the DMR.
(3) Calculations for all limitations which require averaging of measurements shall utilize an arithmetic mean unless otherwise specified by the Agency in the permit.

(f) **Twenty-four hour reporting.** The permittee shall report any noncompliance which may endanger health or the environment. Any information shall be provided orally within 24-hours from the time the permittee becomes aware of the circumstances. A written submission shall also be provided within 5 days of the time the permittee becomes aware of the circumstances. The written submission shall contain a description of the noncompliance and its cause; the period of noncompliance, including exact dates and time; and if the noncompliance has not been corrected, the anticipated time it is expected to continue; and steps taken or planned to reduce, eliminate, and prevent reoccurrence of the noncompliance. The following shall be included as information which must be reported within 24-hours:
(1) Any unanticipated bypass which exceeds any effluent limitation in the permit.
(2) Any upset which exceeds any effluent limitation in the permit.
(3) Violation of a maximum daily discharge limitation for any of the pollutants listed by the Agency in the permit or any pollutant which may endanger health or the environment.
The Agency may waive the written report on a case-by-case basis if the oral report has been received within 24-hours.

(g) **Other noncompliance.** The permittee shall report all instances of noncompliance not reported under paragraphs (12) (d), (e), or (f), at the time monitoring reports are submitted. The reports shall contain the information listed in paragraph (12) (f).

(h) **Other information.** Where the permittee becomes aware that it failed to submit any relevant facts in a permit application, or submitted incorrect information in a permit application, or in any report to the Agency, it shall promptly submit such facts or information.

(13) **Bypass.**
(a) Definitions.
(1) Bypass means the intentional diversion of waste streams from any portion of a treatment facility.
(2) Severe property damage means substantial physical damage to property, damage to the treatment facilities which causes them to become inoperable, or substantial and permanent loss of natural resources which can reasonably be expected to occur in the absence of a bypass. Severe property damage does not mean economic loss caused by delays in production.
(b) Bypass not exceeding limitations. The permittee may allow any bypass to occur which does not cause effluent limitations to be exceeded, but only if it also is for essential maintenance to assure efficient operation. These bypasses are not subject to the provisions of paragraphs (13)(c) and (13)(d).
(c) Notice.
(1) Anticipated bypass. If the permittee knows in advance of the need for a bypass, it shall submit prior notice, if possible at least ten days before the date of the bypass.
(2) Unanticipated bypass. The permittee shall submit notice of an unanticipated bypass as required in paragraph (12)(f) (24-hour notice).
(d) Prohibition of bypass.
(1) Bypass is prohibited, and the Agency may take enforcement action against a permittee for bypass, unless:
(i) Bypass was unavoidable to prevent loss of life, personal injury, or severe property damage;
(ii) There were no feasible alternatives to the bypass, such as the use of auxiliary treatment facilities, retention of untreated wastes, or maintenance during normal periods of equipment downtime. This condition is not satisfied if adequate back-up equipment should have been installed in the exercise of reasonable engineering judgment to prevent a bypass which occurred during normal periods of equipment downtime or preventive maintenance; and
(iii) The permittee submitted notices as required under paragraph (13)(c).
(2) The Agency may approve an anticipated bypass, after considering its adverse effects, if the Agency determines that it will meet the three conditions listed above in paragraph (13)(d)(1).

(14) **Upset.**
(a) Definition. Upset means an exceptional incident in which there is unintentional and temporary noncompliance with technology based permit effluent limitations because of factors beyond the reasonable control of the permittee. An upset does not include noncompliance to the extent caused by operational error, improperly designed treatment facilities, inadequate treatment facilities, lack of preventive maintenance, or careless or improper operation.
(b) Effect of an upset. An upset constitutes an affirmative defense to an action brought for noncompliance with such technology based permit effluent limitations if the requirements of paragraph (14)(c) are met. No determination made during administrative review of claims that noncompliance was caused by upset, and before an action for noncompliance, is final administrative action subject to judicial review.
(c) Conditions necessary for a demonstration of upset. A permittee who wishes to establish the affirmative defense of upset shall demonstrate, through properly signed, contemporaneous operating logs, or other relevant evidence that:
(1) An upset occurred and that the permittee can identify the cause(s) of the upset;
(2) The permitted facility was at the time being properly operated; and
(3) The permittee submitted notice of the upset as required in paragraph (12)(f)(2) (24-hour notice).
(4) The permittee complied with any remedial measures required under paragraph (4).
(d) Burden of proof. In any enforcement proceeding the permittee seeking to establish the occurrence of an upset has the burden of proof.

(15) **Transfer of permits.** Permits may be transferred by modification or automatic transfer as described below:
  (a) Transfers by modification. Except as provided in paragraph (b), a permit may be transferred by the permittee to a new owner or operator only if the permit has been modified or revoked and reissued pursuant to 40 CFR 122.62 (b) (2), or a minor modification made pursuant to 40 CFR 122.63 (d), to identify the new permittee and incorporate such other requirements as may be necessary under the Clean Water Act.
  (b) Automatic transfers. As an alternative to transfers under paragraph (a), any NPDES permit may be automatically transferred to a new permittee if:
    (1) The current permittee notifies the Agency at least 30 days in advance of the proposed transfer date;
    (2) The notice includes a written agreement between the existing and new permittees containing a specified date for transfer of permit responsibility, coverage and liability between the existing and new permittees; and
    (3) The Agency does not notify the existing permittee and the proposed new permittee of its intent to modify or revoke and reissue the permit. If this notice is not received, the transfer is effective on the date specified in the agreement.

(16) All manufacturing, commercial, mining, and silvicultural dischargers must notify the Agency as soon as they know or have reason to believe:
  (a) That any activity has occurred or will occur which would result in the discharge of any toxic pollutant identified under Section 307 of the Clean Water Act which is not limited in the permit, if that discharge will exceed the highest of the following notification levels:
    (1) One hundred micrograms per liter (100 ug/l);
    (2) Two hundred micrograms per liter (200 ug/l) for acrolein and acrylonitrile; five hundred micrograms per liter (500 ug/l) for 2,4-dinitrophenol and for 2-methyl-4,6 dinitrophenol; and one milligram per liter (1 mg/l) for antimony.
    (3) Five (5) times the maximum concentration value reported for that pollutant in the NPDES permit application; or
    (4) The level established by the Agency in this permit.
  (b) That they have begun or expect to begin to use or manufacture as an intermediate or final product or byproduct any toxic pollutant which was not reported in the NPDES permit application.

(17) All Publicly Owned Treatment Works (POTWs) must provide adequate notice to the Agency of the following:
  (a) Any new introduction of pollutants into that POTW from an indirect discharge which would be subject to Sections 301 or 306 of the Clean Water Act if it were directly discharging those pollutants; and
  (b) Any substantial change in the volume or character of pollutants being introduced into that POTW by a source introducing pollutants into the POTW at the time of issuance of the permit.
  (c) For purposes of this paragraph, adequate notice shall include information on (i) the quality and quantity of effluent introduced into the POTW, and (ii) any anticipated impact of the change on the quantity or quality of effluent to be discharged from the POTW.

(18) If the permit is issued to a publicly owned or publicly regulated treatment works, the permittee shall require any industrial user of such treatment works to comply with federal requirements concerning:
  (a) User charges pursuant to Section 204 (b) of the Clean Water Act, and applicable regulations appearing in 40 CFR 35;
  (b) Toxic pollutant effluent standards and pretreatment standards pursuant to Section 307 of the Clean Water Act; and
  (c) Inspection, monitoring and entry pursuant to Section 308 of the Clean Water Act.

(19) If an applicable standard or limitation is promulgated under Section 301(b)(2)(C) and (D), 304(b)(2), or 307(a)(2) and that effluent standard or limitation is more stringent than any effluent limitation in the permit, or controls a pollutant not limited in the permit, the permit shall be promptly modified or revoked, and reissued to conform to that effluent standard or limitation.

(20) Any authorization to construct issued to the permittee pursuant to 35 Ill. Adm. Code 309.154 is hereby incorporated by reference as a condition of this permit.

(21) The permittee shall not make any false statement, representation or certification in any application, record, report, plan or other document submitted to the Agency or the USEPA, or required to be maintained under this permit.

(22) The Clean Water Act provides that any person who violates a permit condition implementing Sections 301, 302, 306, 307, 308, 318, or 405 of the Clean Water Act is subject to a civil penalty not to exceed $25,000 per day of such violation. Any person who willfully or negligently violates permit conditions implementing Sections 301, 302, 306, 307, 308, 318 or 405 of the Clean Water Act is subject to a fine of not less than $2,500 nor more than $25,000 per day of violation, or by imprisonment for not more than one year, or both.
Additional penalties for violating these sections of the Clean Water Act are identified in 40 CFR 122.41 (a)(2) and (3).

(23) The Clean Water Act provides that any person who falsifies, tampers with, or knowingly renders inaccurate any monitoring device or method required to be maintained under this permit shall, upon conviction, be punished by a fine of not more than $10,000, or by imprisonment for not more than 2 years, or both. If a conviction of a person is for a violation committed after a first conviction of such person under this paragraph, punishment is a fine of not more than $20,000 per day of violation, or by imprisonment of not more than 4 years, or both.

(24) The Clean Water Act provides that any person who knowingly makes any false statement, representation, or certification in any record or other document submitted or required to be maintained under this permit, including monitoring reports or reports of compliance or non-compliance shall, upon conviction, be punished by a fine of not more than $10,000 per violation, or by imprisonment for not more than 6 months per violation, or by both.

(25) Collected screening, slurries, sludges, and other solids shall be disposed of in such a manner as to prevent entry of those wastes (or runoff from the wastes) into waters of the State. The proper authorization for such disposal shall be obtained from the Agency and is incorporated as part hereof by reference.

(26) In case of conflict between these standard conditions and any other condition(s) included in this permit, the other condition(s) shall govern.

(27) The permittee shall comply with, in addition to the requirements of the permit, all applicable provisions of 35 Ill. Adm. Code, Subtitle C, Subtitle D, Subtitle E, and all applicable orders of the Board or any court with jurisdiction.

(28) The provisions of this permit are severable, and if any provision of this permit, or the application of any provision of this permit is held invalid, the remaining provisions of this permit shall continue in full force and effect.

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Exhibit

49

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STATE OF ILLINOIS
ENVIRONMENTAL PROTECTION AGENCY

Subject: Waukegan Generating Station
Data: IL0002259
Reviewed By: Jaime Rabins

Date: March 28, 2017

30-Day Notice Review Notes:

The Agency did not receive any comments during the 30-Day Notice Period.

Action: Issue Modified Permit

IEPA - DIVISION OF RECORDS MANAGEMENT
RELEASABLE

JUL 14 2017

REVIEWER: MED

Electronic Filing: Received, Clerk's Office 10/31/2022

CAS 4-10-17
Region 5 EPA
2-17-17

STATE OF ILLINOIS
ENVIRONMENTAL PROTECTION AGENCY

Subject: Waukegan Generating Station
Data: IL0002259
Reviewed By: Jaime Rabins

Date: February 8, 2017

15-Day Notice Review Notes:

The Agency received the following comments from MWG:

1. F01 Unit 7 demineralized water storage tank drain is incorrectly identified as F03 on page 1 of the PNFS and the newspaper public notice.

Response: The change will be made as requested.

2. Special Condition 6 does not reflect the newest electronic reporting rule language.

Response: The language will be updated.

3. Page 7 of the PNFS identifies Vitec 3000 as a corrosion inhibitor and it is actually a scale inhibiter.

Response: The change will be made as requested.

4. The newspaper public notice incorrectly refers to three coal fired boiler and the correct number is two.

Response: The change will be made as requested.

Action: Issue Draft Permit/Fact Sheet for 30-day Public Notice.

IEPA - DIVISION OF RECORDS MANAGEME
RELEASABLE

JUL 14 2017

REVIEWER: MED

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Midwest Generation, LLC
Waukegan Generating Station
401 East Greenwood Avenue
Waukegan, IL 60087

February 2, 2017

VIA OVERNIGHT DELIVERY

RECEIVED
FEB 03 2017
IEPA
BOW/WPC/PERMIT SECTION

Illinois Environmental Protection Agency
Bureau of Water
Division of Water Pollution Control: Permit Section
Attn: NPDES PN Clerk
1021 North Grand Avenue East
Springfield, Illinois 62794

Subject: Waukegan Generating Station—NPDES Permit No. IL0002259
Comments on Draft Permit/Fact Sheet
Notice No. JAR:15042301

Dear Sir or Madam:

Midwest Generation, LLC (MWG) thanks the Illinois Environmental Protection Agency for the opportunity to comment on the above reference Draft Permit and Public Notice/Fact Sheet. This letter summarizes our comments:

- Please note that Outfall **F01** Unit 7 demineralized water storage tank drain is incorrectly identified as Outfall **F03** on the first page of the Public Notice/Fact Sheet and again incorrectly on the page titled, "Public Notice of Draft Permit".

- The Special Condition 6. revision regarding the new Electronic Reporting Rule listed as modification 4. on page 2 of the Public Notice/Fact Sheet was not incorporated into Special Condition 6. on page 10 of the Draft Permit.

- Page seven of the fact sheet identifies Vitec 3000 as a corrosion inhibitor. This material is an antiscalant (scale inhibitor.)

- The "Public Notice of Draft Permit" incorrectly states that the station operates three coal fired boilers. This number should be two.

If you have any questions or require additional information, please contact Ms. Sharene Shealey at (724) 255-3220 or Sharene.Shealey@nrg.com.

Sincerely,

Fredrick Veenbaas
Waukegan Generating Station Environmental Compliance Specialist

cc: Darin LeCrone---Illinois EPA (*via electronic submittal*)
Jaime Rabins---Illinois EPA (*via electronic submittal*)

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CAS Region / USEPA 1-24-17

STATE OF ILLINOIS
ENVIRONMENTAL PROTECTION AGENCY

Subject: Waukegan Generating Station
Data: IL0002259
Reviewed By: Jaime Rabins Date: November 9, 2016

The Agency received a request on September 30, 2013 to discharge 180 gpd of Trona Mill Wash to outfall D01.

The facility is installing a dry sorbent injection flue gas desulfurization system to minimize atmospheric discharges of sulfur dioxide and acid gasses. Trona will be milled and blown into the flue gas ductwork using injection lances. The Trona mills will be washed on a daily basis and be discharged to the East Yard Basin which is monitored at outfall D01.

The Standards Unit reviewed the project. See Memo from Scott Twait dated September 14, 2015.

I received a phone call from Waukegan Generating Station staff a couple of days ago (I did not record the name) stating that the sulfate and chloride reporting limits of 0.1 mg/l in SC16 are too low.

The correct reporting limits are 1 mg/l for chloride and 10 mg/l for sulfate. See April 22, 2015 email from Michelle Rousey the BOW Quality Assurance Officer. Bob Mosher also agreed that the limits should be changed. See his email of the same date.

The reporting limits will be changed as requested.

The agency received a request dated August 31, 2016 to replace the demineralizers used for boiler feed water with reverse osmosis. The discharge will increase from 0.044 to 0.06 MGD but the total dissolved solids will be greatly reduced.

The Standards Unit reviewed the project. See November 1, 2016 Memo from Bob Mosher. The demineralizer wastestreams at B01 will be replaced with reverse osmosis wastes consisting of 65 gpm of reverse osmosis reject and 450 gallons/cleaning of reverse osmosis regeneration. Demineralizer filter backwash outfall C01 subwastestream 6e will be renamed RO filter backwash. Demineralizer filter backwash outfall D01 subwastestream 4 will be renamed RO filter backwash. See November 7, 2016 email from Nathan Rozic.

Special Condition 6 will be revised to reflect the new Electronic Reporting Rule.

Action: Issue Draft Permit/Fact Sheet for 15-day Notice.

Rabins, Jaime

From: Rozic, Nathan J <Nathan.Rozic@nrg.com>
Sent: Monday, November 07, 2016 10:38 AM
To: Rabins, Jaime
Cc: Wehling, Mark
Subject: [External] RE: Waukegan Station

Jaime- please see our responses below. Additionally, I wasn't sure what form the RO approval will be in but if via a formal permit mod. and it wouldn't in anyway delay issuance of the RO authorization, would it be possible to also include the previous TRONA millwash request?

nrg
The power to change life
The energy to make it happen

Nate Rozic
Environmental Manager
NRG Energy Southpointe Operations Center
121 Champion Way
Suite 300
Canonsburg, PA 15317
Office: 724-597-8630
Mobile: 724-554-6208
Email: nathan.rozic@nrg.com

From: Rabins, Jaime [mailto:Jaime.Rabins@Illinois.gov]
Sent: Friday, November 04, 2016 4:59 PM
To: Rozic, Nathan J
Subject: RE: Waukegan Station

Is the demineralizer filter backwash (Outfall C01 subwastestream 6e) being removed? **No, however the subwastestream name should be changed to *RO filter backwash (alternate route) intermittent*.** Note **the frequency of RO filter backwash is expected to be less than the demineralizer filter backwash.**

Is the demineralizer filter backwash (Outfall D01 subwastestream 4) being removed? **No, however the subwastestream name should be changed to *RO filter backwash 0.078 MGD.***

Is outfall F01 Unit 7 Demineralized Water storage Tank Drain being removed? **No.**

Jaime Rabins, P.E.
Environmental Protection Engineer, Industrial Unit
Permit Section
Division of Water Pollution Control
Illinois Environmental Protection Agency

ph: 217-524-3035
fax: 217-782-9891
Jaime.Rabins@Illinois.gov

From: Rozic, Nathan J [mailto:Nathan.Rozic@nrg.com]
Sent: Friday, November 04, 2016 9:54 AM
To: Rabins, Jaime
Subject: [External] RE: Waukegan Station

Thanks Jaime. Appreciate you keeping this moving.

nrg.
The power to change life
The energy to make it happen

Nate Rozic
Environmental Manager
NRG Energy Southpointe Operations Center
121 Champion Way
Suite 300
Canonsburg, PA 15317
Office: 724-597-8630
Mobile: 724-554-6208
Email: nathan.rozic@nrg.com

From: Rabins, Jaime [mailto:Jaime.Rabins@Illinois.gov]
Sent: Friday, November 04, 2016 8:20 AM
To: Rozic, Nathan J
Subject: RE: Waukegan Station

Standards completed the anti-deg and I'm in the process of drafting the permit.

From: Rozic, Nathan J [mailto:Nathan.Rozic@nrg.com]
Sent: Wednesday, November 02, 2016 5:56 PM
To: Rabins, Jaime
Subject: [External] Re: Waukegan Station

Jaime- any update you can provide to allow me to update the station on IEPA review status of this important project would be much appreciated.

Thank you.

Nate Rozic

On Oct 28, 2016, at 9:12 AM, Rozic, Nathan J <Nathan.Rozic@nrg.com> wrote:

> Hi Jaime. Just curious if there was any update on our RO request?

<image001.jpg> <image002.jpg>

Nate Rozic
Environmental Manager
NRG Energy Southpointe Operations Center
121 Champion Way
Suite 300
Canonsburg, PA 15317
Office: 724-597-8630
Mobile: 724-554-6208
Email: nathan.rozic@nrg.com

From: Rabins, Jaime [mailto:Jaime.Rabins@Illinois.gov]
Sent: Thursday, September 29, 2016 9:34 AM
To: Rozic, Nathan J
Subject: FW: Waukegan Station

From: Mosher, Bob
Sent: Thursday, September 29, 2016 8:34 AM
To: Rabins, Jaime
Subject: Waukegan Station

Looks like we will be doing an AA for the new RO. We will probably get to it in a couple of weeks.

Bob Mosher
Manager, Water Quality Standards Section
Division of Water Pollution Control
Illinois Environmental Protection Agency
1021 North Grand Ave. East
P.O. Box 19276
Springfield, IL 62794-9276
217/558-2012

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ILLINOIS ENVIRONMENTAL PROTECTION AGENCY

1021 NORTH GRAND AVENUE EAST, P.O. BOX 19276, SPRINGFIELD, ILLINOIS 62794-9276 • (217) 782-3397
BRUCE RAUNER, GOVERNOR ALEC MESSINA, ACTING DIRECTOR

Memorandum

Date: November 1, 2016

To: Jaime Rabins

From: Bob Mosher RM

Subject: Midwest Generation Waukegan Antidegradation Assessment
NPDES Permit No. IL0002259 Lake County

The subject facility has applied for a permit modification to allow the transformation from ion exchange to reverse osmosis (RO) for boiler water treatment. The change involves Outfall B01, which reports to Outfall 001. The existing ion exchange demineralizer will be replaced by two RO units, one serving as a back-up. Water is withdrawn from Lake Michigan for the old and new systems. Slightly more water is required for the RO system and the discharge will increase from 0.044 MGD to 0.06 MGD. However, because the ion exchange system required the use of sulfuric acid and sodium hydroxide, discharge of sulfate and total dissolved solids will be greatly reduced by the RO system. The RO system will require hydrochloric and peracetic acid containing cleaning solutions and because of this chloride loading in the discharge will increase slightly. This review relies on information contained in a letter dated August 31, 2016 provided by the applicant.

Identification and Characterization of the Affected Water Body.

Lake Michigan (segment code QH-04) has a 7Q10 flow of zero cfs and is a Lake Michigan Basin water. Lake Michigan is listed on the draft 2016 Illinois Integrated Water Quality Report and Section 303(d) List as impaired for fish consumption and primary contact uses. Causes of fish consumption use impairment are given as mercury and PCBs. The cause of primary contact use impairment is given as fecal coliform bacteria. Aquatic life use is not assessed. Lake Michigan is not listed as a biologically significant stream in the 2008 Illinois Department of Natural Resources Publication *Integrating Multiple Taxa in a Biological Stream Rating System* nor is it given an integrity rating in that publication for this location. Lake Michigan is not designated as an enhanced water pursuant to the dissolved oxygen water quality standard at this location.

Identification of Proposed Pollutant Load Increases or Potential Impacts on Uses.

The parameter with an increase in loading is chloride. Loading of chloride will increase from 25 pounds per day currently to 30 ppd. This is because the RO system is cleaned in part using hydrochloric acid. While chloride loading rises very slightly, sulfate load decreases by 2059 ppd. Slightly more lake water will be pumped for operation of the RO system. No adverse impact on the uses of Lake Michigan is anticipated.

Fate and Effect of Parameters Proposed for Increased Loading.

The added chloride will persist in Lake Michigan. The additional amount of chloride added will be dissipated quickly and will not be measurable after mixing with cooling water prior to discharge.

Purpose and Social & Economic Benefits of the Proposed Activity.

Illinois EPA encourages companies to convert ion exchange softening to RO. The environment benefits from less dissolved substances in discharges and reduced transportation of chemicals on roads and rails. The slight increase in chloride is offset many times over by the reduction in sulfate. Conversion to RO water softening will help allow the facility to remain viable and will therefore preserve jobs.

Assessments of Alternatives for Less Increase in Loading or Minimal Environmental Degradation.

There is very little downside to the change from ion exchange to RO water softening. Alternatives to avoid the discharge of slightly increased chloride loading would be so onerous that the facility would chose to retain the existing ion exchange mode of water softening.

Summary Comments of the Illinois Department of Natural Resources, Regional Planning Commissions, Zoning Boards or Other Entities

The Illinois Department of Natural Resources was consulted regarding threatened and endangered species issues for the discharge location via the EcoCAT system on October 17, 2016. Endangered species are known from the terrestrial areas around Lake Michigan at this location. Other endangered species, a turtle and five species of birds, are dependent on water but are not likely found in the habitat near the discharge. IDNR responded to the endangered species consultation in a letter dated October 28, 2016 that terminated consultation.

Agency Conclusion.

This preliminary assessment was conducted pursuant to the Illinois Pollution Control Board regulation for Antidegradation found at 35 Ill. Adm. Code 302.105 (antidegradation standard) and was based on the information available to the Agency at the time the draft permit was written. We tentatively find that the proposed activity will result in the attainment of water quality standards; that all existing uses of the receiving waters will be maintained; that all technically and economically reasonable measures to avoid or minimize the extent of the proposed increase in pollutant loading have been incorporated into the proposed activity; and that this activity will benefit the local community by preserving jobs. Comments received during the NPDES permit public notice period will be evaluated before a final decision is made by the Agency.

cc: FOS Region 2
Surface Water Manager, Des Plaines RO

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RECEIVED
SEP 02
IEPA
BUREAU OF WATER PERMIT SECTION

Midwest Generation, LLC
Waukegan Generating Station
401 East Greenwood Avenue
Waukegan, Illinois 60087

August 31, 2016

VIA OVERNIGHT DELIVERY

Mr. Darin LeCrone, P.E.
Manager, Industrial Unit
Illinois Environmental Protection Agency
Division of Water Pollution Control
1021 North Grand Avenue East
Springfield, IL 62702

Subject: Midwest Generation, LLC
Waukegan Generating Station
NPDES Permit No. IL0002259
Request for Determination of Modification

Dear Mr. LeCrone:

Midwest Generation, LLC (MWG) would like to request a determination of modification for a proposed process change that would reduce chemical usage and pollutant loading for Waukegan Generating Station, NPDES Permit IL0002259. This submittal is a supplement to the associated June 3, 2016 Chemical Additive Request for Review forwarded onto Mr. Brian Koch.

MWG would like to retire our current demineralizer and replace it with a reverse osmosis (RO) system, utilizing existing tanks, pumps and piping.

By way of background information, in order to provide high purity water to the boilers, a system to remove indigenous solids from the service water is required. Demineralizers operate by using cationic and anionic resins to reduce these solids. The resins must be regenerated in order to maintain their effectiveness and it is these regenerations that produce the current waste stream at Outfall B01. Regenerations require the use of approximately 1.2 million pounds of sulfuric acid and 200,000 pounds of sodium hydroxide (caustic soda) annually to remove the solids from the resins. The RO system is expected to only use 6,000 pounds of caustic soda annually for routine pH adjustment. Although associated average low volume wastewater (membrane reject and cleaning waste) flow will slightly increase by 0.016 MGD , a significant net decrease in pollutant loading is expected at Outfalls B01 and 001 as identified by the estimated 85% reduction in TDS through elimination of the resin regeneration process. This is further outlined in the table below.

Proposed new chemical additives include: AntiScale, Peracetic Acid, HCL, and Citric Acid.

The current plan is to add two 220 gpm ROs at Waukegan (only one system will operate while the other is in back-up mode). The influent flow to the RO would be 285 gpm. An antiscalant composed of nonhazardous components will be added at 5 gallons/ day. An alkaline feed of caustic soda will be added at 20 gallons/ day. There will be a 65 gpm concentrate waste stream from the RO with TDS at 800 ppm, primarily composed of Lake Michigan dissolved solids. This concentrate stream would flow to Outfall B01.

Depending on operations, the RO will require maintenance cleaning every 2 to 4 days. Roughly either 2 gallons of hydrochloric acid and 18 gallons of Peracetic acid or 1.5 gallons of sulfuric acid and 18 gallons of Peracetic acid will be used for each maintenance cleaning event (Column headings Reverse Osmosis 1 and Reverse Osmosis 2 respectively in table below). In addition, a monthly cleaning of the RO pretreatment system will be required consisting of the use of approximately 13 gallons of citric acid solution. More intensive less frequent cleanings will be required every 3 to 6 months with each of these cleanings being expected to use 450 gallons each of citric acid and caustic soda. All proposed spent cleaning solutions will be discharged to Outfall B01. Current loading (Demineralizer) and proposed (RO) loading reductions are outlined below:

	Current	Reverse Osmosis 1	Reverse Osmosis 2	Net Change 1	Net Change 2
Average Flow (MGD)	0.044	0.060	0.060	+ 0.016	+ 0.016
TDS (ppm)	7300	800	812		
Cl^- (ppm)	69.7	59.6	53.1		
SO_4^{-2} (ppm)	5770	71.8	94.3		
TDS (lb/day)	2651	399	405	- 2251.8	- 2245.8
Cl^- (lb/day)	25	30	26	+ 4.4	+ 1.2
SO_4^{-2} (lb/day)	2095	36	47	- 2059.2	- 2048.0

All flows and loading are averaged. Assume water production of 75 M-gal/year.

Reverse Osmosis 1 uses HCl as a cleaning agent.

Reverse Osmosis 2 uses H_2SO_4 as a cleaning agent.

In 2006 and 2010 Crawford and Joliet 9 and 29 Generating Stations likewise reduced pollutant loading by switching from demineralizers to RO, which also slightly increased the volume of water discharged. This pollutant loading reduction was approved without permit modification.

MWG again does not believe that a Waukegan Generating Station NPDES permit modification is required to perform the proposed improvement in wastewater discharge quality under Illinois Pollution Control Board Chapter 1: Subtitle C Regulations, Sub-part A, 35 Ill. Admin. Code 301.315 and is requesting timely IEPA concurrence as well as approval of the proposed chemical additives.

If you have any questions regarding this submittal, please contact mark Wehling at (847) 599-2201 or at Mark.Wehling@nrg.com or Nate Rozic at (724) 597-8630 or at Nathan.rozic@nrg.com.

Thank you for your attention to this matter.

Sincerely,

Mark K. Nagel, P.E.
Station Director
Waukegan Generating Station

Rabins, Jaime

From: Lieberoff, Barb
Sent: Thursday, September 01, 2016 9:28 AM
To: Rabins, Jaime
Subject: RE: Waukegan Generating Station

Thanks! This will definitely merit an EJ letter. Let me discuss with Brad and Ken. This might be easy enough to put EJ language in the public notice once your review is completed. I will let you know.

Barb Lieberoff
Community Relations Coordinator
Illinois EPA
217/524-3038
barb.lieberoff@illinois.gov

From: Rabins, Jaime
Sent: Wednesday, August 31, 2016 4:49 PM
To: Lieberoff, Barb
Subject: Waukegan Generating Station

Barb,

I received a request to modify the NPDES Permit IL0002259 to replace the demineralizers with two reverse osmosis units. This will require modification of the NPDES permit and public notice.

Jaime Rabins, P.E.
Environmental Protection Engineer, Industrial Unit
Permit Section
Division of Water Pollution Control
Illinois Environmental Protection Agency

ph: 217-524-3035
fax: 217-782-9891
Jaime.Rabins@Illinois.gov

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MEV

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ILLINOIS ENVIRONMENTAL PROTECTION AGENCY

1021 NORTH GRAND AVENUE EAST, P.O. BOX 19276, SPRINGFIELD, ILLINOIS 62794-9276 • (217) 782-2829
BRUCE RAUNER, GOVERNOR LISA BONNETT, DIRECTOR

Memorandum

Date: June 13, 2016

To: Jaime Rabins

From: Brian Koch

Subject: Midwest Generation - Waukegan
Water Treatment Additives Evaluation
NPDES Permit No. IL0002259 Lake County

The subject facility requests approval for use of water treatment additives in their new reverse osmosis (RO) system, which is replacing the existing demineralizer system. Due to the required regeneration of resins in the demineralizer system, the existing system uses approximately 1.2 million pounds of sulfuric acid and 200,000 pounds of sodium hydroxide annually to remove solids from the resins. The new RO system would only use 6,000 pounds of caustic soda annually, which would constitute an 89% reduction in total dissolved solids loadings from Outfall B01. While a slight increase in average low volume wastewater flow from Outfall B01 would occur (0.079 MGD), the significant reduction of total dissolved solids would be beneficial to the overall quality of effluent. A review of the proposed water treatment additives is provided below.

Sodium hydroxide, hydrochloric acid, citric acid, and Vitec 3000 (corrosion inhibitor): These products have previously been reviewed and approved for use at this facility. Small increases in usage resulting from operation and cleaning of the RO system would not adversely affect aquatic life in the receiving water or require revised permit limitations. Use of the products in the RO system is approved.

Peracetic acid: The product is a disinfectant that would be used for maintenance cleaning of the RO membranes every 2-4 days. The product would be dosed at a maximum concentration of 1,000 ppm into 600 gallons of cleaning water, with the RO membranes being soaked in the cleaning solution to maximize disinfection. The spent cleaning solution would be sent to Outfall B01 and internally diluted with Outfall 001 effluent prior to discharge. The worst case discharge concentration of the product would be 0.3 ppm, which is roughly equivalent to the acute toxicity of peracetic acid (based on information ascertained from on-going regional efforts to develop criteria for this substance). However, the actual peracetic acid concentration at Outfall 001 would be far lower, and likely non-detect, after interacting with the RO membranes as well as any residual organic material in B01/001 effluent. Use of the product is approved.

These recommendations reflect a water quality standards perspective only and should not be construed as being indicative of all factors to be taken into consideration by the permit writer.

BK:bk/MidwestGenWaukegan_June16.docx

cc: Jay Patel
Des Plaines Region Surface Water Manager

4302 N. Main St., Rockford, IL 61103 (815) 987-7760
595 S. State, Elgin, IL 60123 (847) 608-3131
2125 S. First St., Champaign, IL 61820 (217) 278-5800
2009 Mall St., Collinsville, IL 62234 (618) 346-5120
9511 Harrison St., Des Plaines, IL 60016 (847) 294-4000
412 SW Washington St., Suite D, Peoria, IL 61602 (309) 671-3022
2309 W. Main St., Suite 116, Marion, IL 62959 (618) 993-7200
100 W. Randolph, Suite 10-300, Chicago, IL 60601 (312) 814-6026

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Midwest Generation, LLC
Waukegan Generating Station
401 East Greenwood Avenue
Waukegan, Illinois 60087

June 3, 2016

RECEIVED
JUN 7 2016
SW/WS/IFAS

Mr. Brian Koch
Illinois Environmental Protection Agency
Bureau of Water, Water Quality Standards
1021 North Grand Avenue East
Springfield, IL 62702

Subject: Midwest Generation, LLC
Waukegan Generating Station
NPDES Permit No. IL0002259
Request for Review of proposed Chemical Additives

Dear Mr. Koch:

Midwest Generation, LLC (MWG) submits the enclosed documentation for Waukegan Generating Station's proposed Reverse Osmosis (RO) chemical additives, consistent with IEPA's instructions for Water Treatment Additives.

The RO system will replace the existing demineralizer system and will utilize existing tanks, pumps and piping.

By way of background information, in order to provide high purity source water to the boilers, a system to remove indigenous solids from the service water is required. Demineralizers operate by using cationic and anionic resins to reduce these solids. The resins must be regenerated in order to maintain their effectiveness and it is these regenerations that produce the waste stream at Outfall B01. Regenerations require the use of approximately 1.2 million pounds of sulfuric acid and 200,000 pounds of sodium hydroxide (caustic soda) annually to remove the solids from the resins. The RO system is expected to only use 6,000 pounds of caustic soda annually for routine pH adjustment. Although associated average low volume wastewater flow will slightly increase by 0.079 MGD, a significant net decrease in pollutant loading is expected at Outfalls B01 and 001 as identified by the estimated 89% reduction in TDS through elimination of the resin regeneration process.

Proposed new chemical additives include: AntiScalant, Peracetic Acid, HCl, and Citric Acid.

The current plan is to add two 220 gpm ROs at Waukegan (only one system will operate while the other is in back-up mode). The influent flow to the RO would be 285 gpm. An antiscalant (Avista Vitec) composed of nonhazardous components will be added at 5 gallons/ day. An alkaline feed of sodium hydroxide will be added at 20 gallons/ day. There will be a 65 gpm concentrate waste stream from the RO with TDS at 800 ppm, primarily composed of concentrated Lake Michigan dissolved solids and 80 ppm sodium bi-carbonate . This concentrate stream would flow to Outfall B01.

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Depending on operations, the RO will require maintenance cleaning every 2 to 4 days. Roughly 2 gallons of hydrochloric acid and 18 gallons of peracetic acid will be used for each maintenance cleaning event. Spent cleaning solution would go to Outfall B01. In addition, a monthly cleaning of the RO pretreatment system will be required. Each of these cleaning events will require the use of approximately 13 gallons of citric acid solution. This spent solution will also be sent to Outfall B01. More intensive less frequent cleanings will be required every 3 to 6 months. Each of these cleanings is expected to use 450 gallons each of citric acid and sodium hydroxide with the spent cleaning solution discharged to Outfall B01.
In 2006 and 2010 Crawford and Joliet 9 and 29 Generating Stations likewise reduced pollutant loading by switching from demineralzers to RO, which also slightly increased the volume of water discharged. This pollutant loading reduction was approved without permit modification.

MWG again does not believe that a Waukegan Generating Station NPDES permit modification is required to perform the proposed improvement in wastewater discharge quality under Illinois Pollution Control Board Chapter 1: Subtitle C Regulations, Sub-part A, 35 Ill. Admin. Code 301.315 and is requesting IEPA concurrence as well as approval of the proposed chemical additives.

If you have any questions regarding this submittal, please contact Mark Wehling at (847) 599-2201 or at Mark.Wehling@nrg.com or Nate Rozic at (724) 597-8630 or at Nathan.rozic@nrg.com.

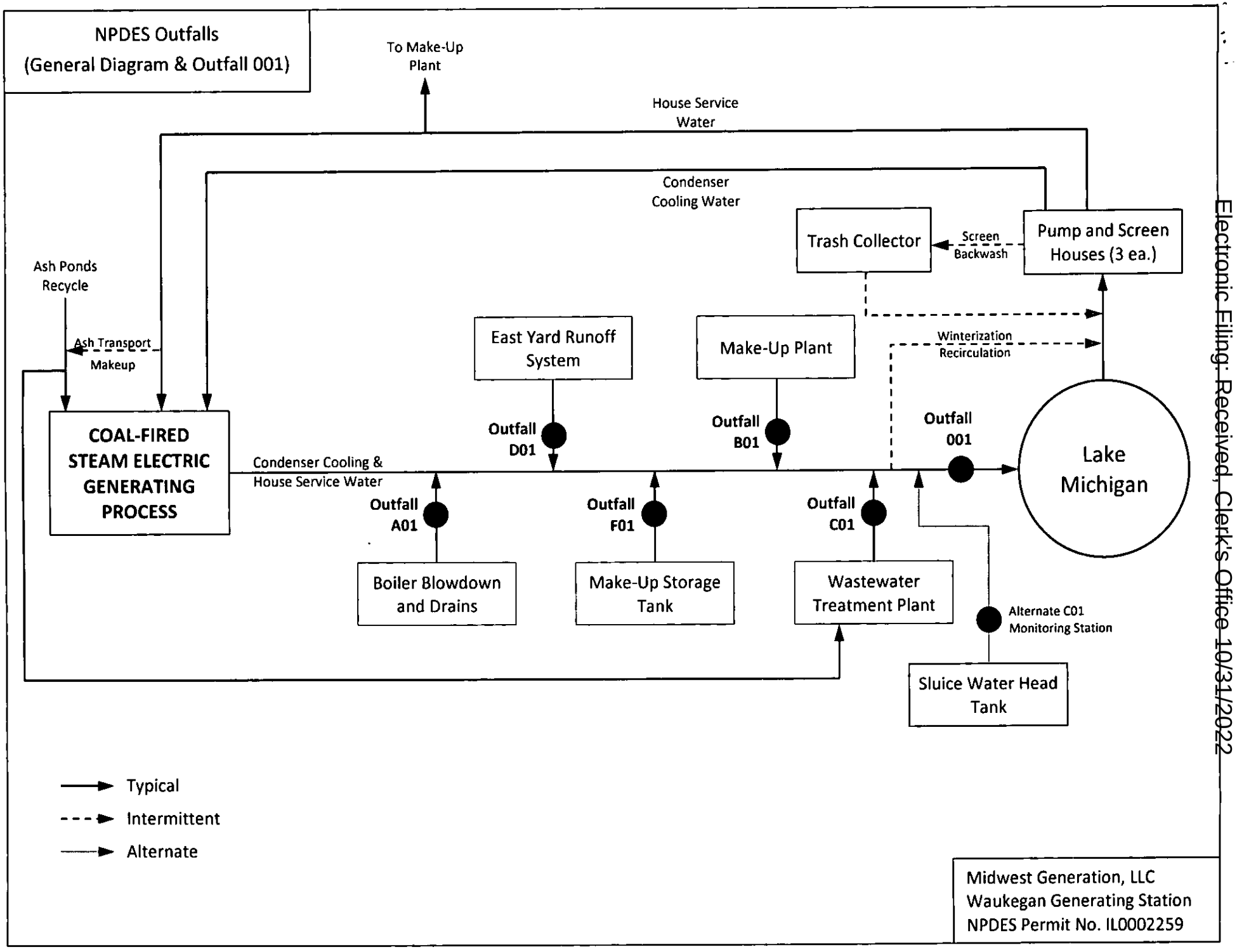
Thank you for your attention to this matter.

Sincerely,

Mark K. Nagel, P.E.
Station Director
Waukegan Generating Station

Enclosures

cc: Nate Rozic- NRG Energy



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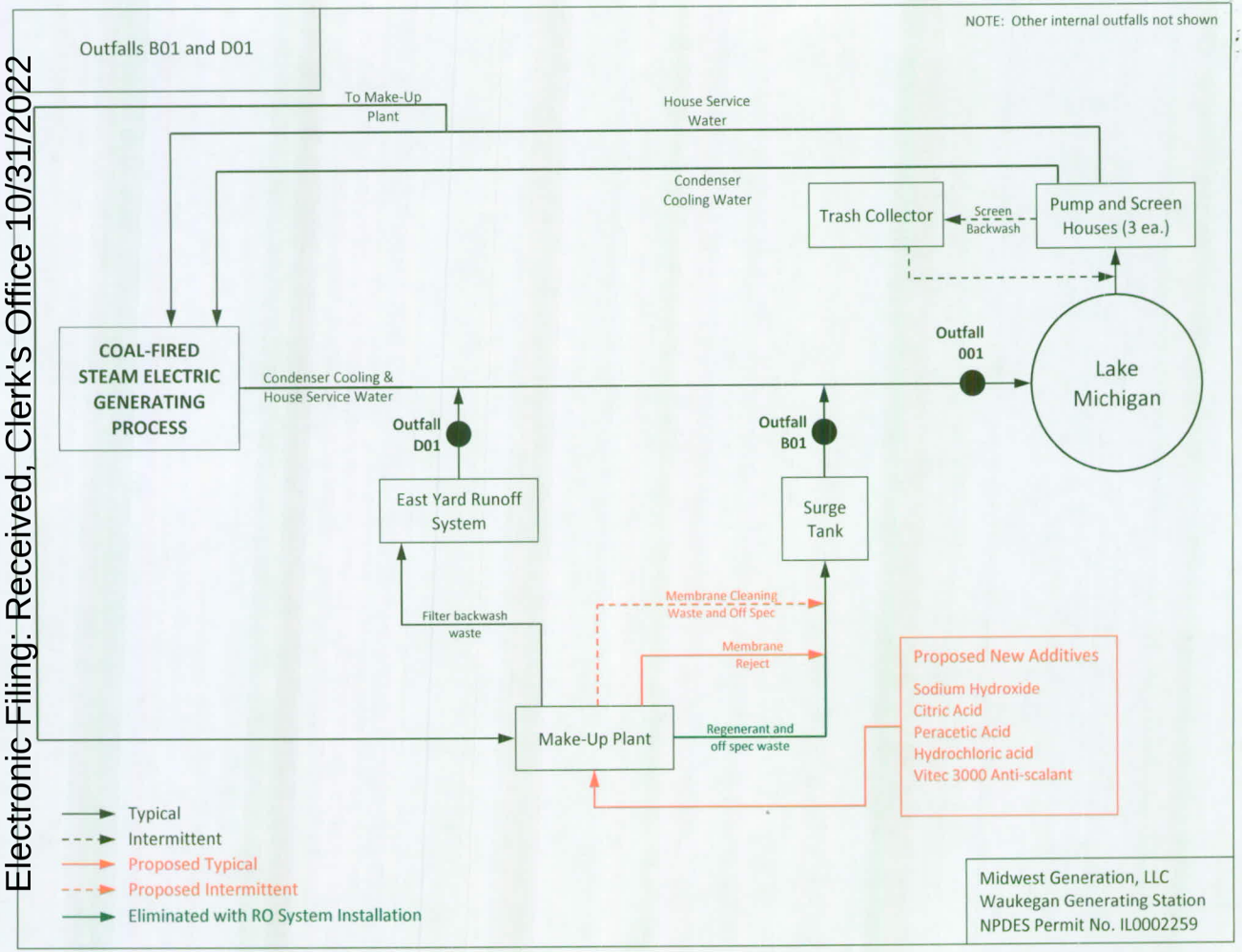

Additive	Function	Frequency	Duration	Dose	Volume Applied To	Fate (Neutralization, Degradation, and/or Internal Dilution Prior to Outfall	Internal Outfall Discharge	Estimated Final Effluent Concentration (Outfall 001)
Sodium Hydroxide	Conversion of free CO_2 to bi-carbonate	Continuous	Continuous	100 ppm (est)	220 gpm	Neutralization with free CO_2 in Water	B01	N.D.
Avista Vitec	Anti Scalant	Continuous	Continuous	2 ppm	220 gpm	Internal Dilution	B01	N.D.
Sodium Hydroxide	Maintenance Cleaning RO	90 days	Recirculated	1000 ppm	600 gal	Degradation/ Internal Dilution	B01	.3 ppm
Citric Acid	Maintenance Cleaning RO	90 days	Recirculated	4%	600 gal	Degradation/ Internal Dilution	B01	10 ppm
Peracetic Acid	Maintenance Cleaning UF	2 days	Soak	1000 ppm	600 gal	Degradation/ Internal Dilution	B01	.3 ppm
Hydrochloric Acid	Maintenance Cleaning UF	2 days	Soak	1000 ppm	600 gal	Degradation/ Internal Dilution	B01	.3 ppm
Citric Acid	Clean in Place UF	30 days	Recirculated	4%	600 gal	Degradation/ Internal Dilution	B01	10 ppm

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Material Safety Data Sheet

Citric Acid Solution 50%

Section 01 · Product and Company Identification

Date Prepared: 06.01.2010
Revision Date: 06.01.2010

For More Information Call:
304-748-8200
800-879-1725

Emergency Phone Number:
ChemTrec: 800-424-9300
24 Hours/Day—7 Days/Week

TRADE NAME: Citric Acid Solution
CAS NUMBER: 77-92-9

Section 02 · Hazardous Ingredients

HAZARDOUS INGREDIENT	PERCENT	CAS #	PEL
Citric Acid	50%	77-92-9	Not Established

Section 03 · Physical Data

APPEARANCE: Clear, Colorless
ODOR: Acidic Odor
BULK DENSITY: 10.330 lb/gal.
pH : 1.65 +/- 0.3
SOLUBILITY IN WATER: 100% - Complete
VAPOR PRESSURE (MMhG): N/A
VAPOR DENSITY (AIR=1) N/A
BOILING POINT: 208°F
FREEZING/MELTING POINT: 29°F
SPECIFIC GRAVITY 1.241 (WATER=1.000)

Section 04 · Fire and Explosion Data

FLASH POINT: N/A—Water borne product
EXTINGUISHING MEDIA: Water, water spray, dry chemical, carbon dioxide or foam. Remove container from fire source if possible and safe to do so.
SPECIAL FIRE FIGHTING PROCEDURES: Always use personal protective equipment or self-contained breathing apparatus when fighting a fire in an enclosed area.

Section 05 · Reactivity Data

STABILITY: Stable
HAZARDOUS DECOMPOSITION: CO (Carbon Monoxide), CO_2 (Carbon Dioxide) may be formed on burning in limited air supply.
HAZARDOUS POLYMERIZATION: Will not occur
INCOMPATIBILITY: Strong Bases, Oxidizing Agents

As the result of our inspection(s), this certifies that the material identified above, blended by Celta Chemical Company, Inc., meets or exceeds all conformance standards listed above, and fully complies with the customer's order. In no way is this certificate intended to alter Celta Chemical's General Terms & Conditions of the parties' contract.

Section 06 · Health Data

EMERGENCY OVERVIEW:	Odorless, colorless solution with a strong acidic taste. Citric acid solutions may be a skin and mucous membrane irritant. It is also a strong eye irritant and may produce allergenic reactions in some individuals.
ROUTES OF ENTRY:	Eyes, Skin, Inhalation
INHALATION:	May cause mucous membrane irritation with symptoms of a sore throat, coughing and/or shortness of breath.
INGESTION:	May cause acute gastrointestinal irritation with abdominal pain.
SKIN (DERMAL):	May cause irritation with redness, swelling and pain.
EYES:	May cause irritation with redness, pain, conjunctivitis, possible eye burns, ulceration and permanent cloudiness.
POTENTIAL CARCINOGEN:	Not a carcinogen or potential carcinogen according to the National Toxicology Program I.A.R.C. Monographs and OSHA
MEDICAL CONDITIONS	
AGGRAVATED BY EXPOSURE:	Conjunctivitis, dermatitis with long or repeated contact
HUMAN EXPERIENCE:	Health injuries are not known or expected under normal use.
ACUTE TOXICITY:	$L.D._{50}$/p.o./rat 11,700 mg/kg
	$L.D._{50}$/p.o./rat 885 mg/kg
	$L.D._{50}$/p.o./mouse 5,040 mg/kg
	$L.D._{50}$/p.o./mouse 961 mg/kg
CHEMICAL OXYGEN DEMAND:	(COD) = 728 mg o_2 /g
READILY BIODEGRADABLE:	(BOD) = 528 mg o_2 /g
BIOACCUMULATION:	98% after 2 days
ECOTOXICITY EFFECTS:	Toxicity to Fish (LC_{50}/96h/goldfish=440-706 mg/L Toxicity to Bacteria (ECO) - >10,000 mg/L

Section 07 · First Aid

SWALLOWING (INGESTION):	Drink large amounts of water. DO NOT induce vomiting. Consult a physician if necessary
EYES:	Flood eyes and eye lid area with water for 15 minutes. Call physician and seek medical advice.
SKIN (DERMAL):	Wash off immediately with soap and water. Rinse thoroughly. If irritation develops, call a physician.

Section 08 · Employee Protection

EXPIRATORY PROTECTION:	None needed if exposure limits are not exceeded.
PROTECTIVE CLOTHING:	Gloves, Goggles/Safety Glasses, Normal work clothing covering arms and legs.
EXPOSURE LIMITS:	Not established for this product.
VENTILATION:	Local exhaust to provide clean, general ventilation

Section 09 · Spill and Disposal Data

SPILLS:	Do not allow material to dry. Dried material is more irritating than liquid to both eyes and mucous membranes. Contain spill if possible to do so without risk of personal injury or harm. Wipe up or absorb spill on suitable material. Place in approved container for disposal.
WASTE DISPOSAL:	Any disposal must be in compliance with local, state and federal laws and regulations. Contact local or state environmental agencies for specific rules.

Section 10 · Handling/Storage/Transportation Data

HANDLING:	Avoid allowing material to dry. Resultant powder is more irritating than liquid and should avoid being breathed. Wash all splashes and spillages with water. Avoid letting washings go to storm sewers or waterways without neutralization. Comply with all existing regulations for discharges.
STORAGE:	Store in a cool, dry place away from incompatible materials, protect containers from damage.
STORAGE TEMPERATURE:	Ambient
INCOMPATIBLITIES:	Avoid contact with strong bases and oxidizing agents
EMPTY CONTAINERS:	Can retain product residue and odors. Observe all label precautions even after the container is emptied. Do not reuse containers unless thoroughly cleaned.
PROPER SHIPPING NAME:	Citric Acid Solution
HAZARD CLASS AND LABEL:	Not DOT regulated

Section 11 · Other Regulatory Information

GENERAL:	Citric Acid is generally regarded as safe (gras) by USA FDA, 21 CFR 182.1033 Meets the criteria for hazardous material as defined by OSHA Hazard Communication Standard 29 CRF 1910.1200. Listed European Food Additive E330. This material is listed on the TSCA Inventory List
CERCLA:	Not Hazardous *(Comprehensive Response Compensation and Liability Act)*
SARA TITLE III:	Not considered hazardous *(Superfund Amendments and Reauthorization Bill)*
FOREIGN INVENTORY STATUS:	Canadian DSL *(Domestic Substance List)*
CA PROP 65:	Does not contain any California Prop 65 Substances

Section 12 · Additional Information

DISCLAIMER: The information contained within this Material Safety Data Sheet is for the specific material described only and may not be valid if the material is used in combination with any other materials or process. The user is responsible to determine the completeness of the information and suitability for the user's own particular use. To the knowledge and belief of Celta Chemical, the information is accurate and reliable as of the date indicated but Celta Chemical makes no express implied warranty of merchantability for the material or for the information.

MATERIAL SAFETY DATA SHEET

Product ID: Distilled Peracetic Acid

SECTION 1 - Identification of Product and Supplier Information

Manufacturer's Name:		Texas Technology Associates, Inc.
Manufacturer's Mailing Address:		PO Box 34059, Houston, Texas 77234-4059
Shipper's Name:		Texas Technology Associates, Inc.
Shipper's Address:	Physical:	1410 Preston Avenue, Suite A, Pasadena, Texas 77503-2554
	Mailing:	PO Box 34059, Houston, Texas 77234-4059
Information Telephone Number:		281-486-9863
Emergency Telephone Number:		281-486-9863
Chemical Name and Synonyms:		peracetic acid, peroxyacetic acid, ethaneperoxic acid, acetylhydroperoxide
Chemical Family:		Organic peroxide
Molecular Formula:		$C_2H_4O_3$
Date MSDS Prepared or Revised:		June 15, 2009

SECTION 2 - Composition and Ingredients Information

Chemical Name	CAS Number	Wt.%	EC No.	EC Class
Peracetic Acid	79-21-0	20-35	201-186-8	O, C, R20/21/22, 35; Xi, R36/37/38; N, R50; R7
Acetic Acid	64-19-7	<3	200-580-7	C, R34/35; Xi, R36/38
Hydrogen Peroxide	7722-84-1	<1	231-765-0	O, Xi, R36/38
Water	7732-18-5	Balance	231-791-2	Not classified as hazardous

SECTION 3 - Hazards Identification

Emergency overview:

Aqueous peracetic acid is a clear liquid having a pungent odor similar to that of acetic acid. It is highly corrosive to all body parts and may be fatal if swallowed or inhaled. Exposure requires special first aid and timely medical follow-up. Not flammable, but powerful oxidizing agent that assists combustion and decomposes in the presence of metals and alkalis and/or excessive heat leading to the buildup of pressure in un-vented containers and the risk of explosion.

Potential health effects:

- Poison by ingestion.
- Corrosive to skin and can cause serious eye damage.
- Severely irritating to respiratory tract, potentially lethal.

(For more information on health effects refer to Section No. 11–Toxicological Information).

SECTION 4 - First Aid Measures

Eyes: Immediately flush eyes with plenty of water for at least 15 minutes (keep eyelids apart and remove contacts if easily accomplished). Seek medical aid immediately.

Skin: Immediately flush skin with running water for at least 15 minutes while removing contaminated clothing and shoes. Wash thoroughly with soap and water. Flush contaminated clothing and shoes with water. Seek immediate medical aid immediately.

Ingestion: Flush mouth with water. Get immediate medical aid. If conscious give several glasses of water or milk. Never give fluids if the victim is unconscious or having convulsions. Do not induce vomiting. Seek medical aid immediately.

Inhalation: Remove from exposure to fresh air immediately. Keep victim warm and quiet. If not breathing, give artificial respiration. Seek medical attention.

SECTION 5 - Fire Fighting Measures

Fire/explosion hazard	Combustible – oxidizer – decomposition releases oxygen that can initiate or promote combustion and cause pressure buildup in containers and confined spaces..
Flash point	Approximately 70 deg C (Closed Cup)
Flammable limits	Not available
Fire fighting procedures	Use large amounts of water only to extinguish a fire. Do not use powder or CO_2 type extinguishers; these are not effective.. Use water spray to keep fire-exposed containers cool. Fight fire from protected location or maximum distance. Use proper personal protective equipment and positive pressure self-contained breathing apparatus. .

SECTION 6 - Accidental Release Measures

Personal precautions:	Emergency personnel must use full personal protective equipment (see Section 8) to prevent exposure. Remove all sources of ignition. Approach release from upwind.
Environmental: precautions	If possible, shut off the leak. Prevent liquid entering sewers without dilution.
Methods of cleaning up:	Contain the spill with sand or similar non-combustible material. Remove all inappropriate materials (certain metals and organic materials). Dilute with large amount of water. Do not return product to container or tank due to the risk of decomposition.

SECTION 7 - Handling and Storage

Safe handling suggestions:

- Handle product with care and avoid any contamination (set up safety procedures)
- Do not return product to container or tank due to the risk of contamination and decomposition.
- Avoid contact with eyes, skin and breathing of vapors.
- Do not confine product in unvented vessel or between closed valves.
- Use adequate venting devices on all packagings, containers and tanks.
- Do not use valves and pumps needing lubricants.

Precautions for safe handling:

- During handling, wear personal protective equipment.
- Drain and clean pipes and facilities before any maintenance.
- Operate in a well-ventilated area.
- Maintain eye wash and safety shower facilities.

Storage: Technical measures

- Storage areas should be built with non-combustible materials and the floors should be impermeable and raised so that if an accidental leak occurs, peracetic acid will flow to a safe area or be retained.
- Use vessels and equipment approved for peracetic acid
- Use adequate venting devices on all packaging, containers and tanks.
- Do not confine product in unvented vessel or between closed valves.
- Containers should be checked regularly by visual observation for any signs of abnormality (e.g. bulging or temperature increase).
- Containers must only be used for peracetic acid
- Regularly verify the availability of water to deal with emergencies.
- Comply with instructions regarding sizes of packagings at different temperatures.

Storage conditions:

- Store in a cool (<5 deg C) and vented tank or in cooled, dark, clean and well-ventilated area.
- Keep away from incompatible and combustible materials.

Incompatible materials:

- Peracetic acid should be stored separated from organic and alkaline substances, chlorides and metals.

SECTION 8 - Exposure Controls / Personal Protection

Chemical Name	ACGIH	OSHA
Hydrogen Peroxide	1 ppm (TWA)	1 ppm (PEL)
Acetic Acid	15 ppm (STEL)	10 ppm PEL)
Peracetic Acid	N.A.	N.A.

Personal protective equipment:

- Work suit, boots and gloves made of neoprene or nitrile rubber.
- Chemical goggles and face shield by open handling.
- Gas mask with filter A or B. Breathing apparatus if necessary.

Precaution measures:

- Eye wash and safety shower must be available.
- Contaminated clothes and equipment must be washed thoroughly with water without delay.
- Do not wear leather shoes or cotton clothes due to fire risk.

SECTION 9 - Physical and Chemical Characteristics

Molecular weight	76.0 (peracetic acid)
Formula	CH_3C000H (peracetic acid)
Appearance:	Clear liquid
Odor:	Pungent odor similar to acetic acid
Physical state	Liquid solution

pH	N.E.
Vapor pressure	approximately 50 mm Hg at 42 deg C
Vapor density (air = 1):	0.79
Boiling point:	105 - 110 deg C at 760 mm Hg (decomposes at temperature >55 deg C)
Melting point	N.E.
Solubility in water:	Completely soluble and miscible.
Specific gravity (H_20 = 1):	1.04
SADT	Passed at >50 deg C (49 CFR 173.21, UN Method 28)

SECTION 10 - Stability and Reactivity

Commercial solutions of aqueous peracetic acid produced on-site where they are consumed are usually stable for at least 24-48 hours, particularly when stored under refrigerated conditions (5 deg C or below). There are two generally recognized mechanisms of aqueous peracetic acid decomposition: 1) In the presence of metals, alkalis and other contaminants (see below) peracetic acid decomposes to acetic acid and oxygen with the evolution of considerable heat (see below) and buildup of potentially dangerous levels of pressure in un-vented containers. In the absence of contaminants, this decomposition reaction proceeds very slowly; 2) Aqueous peracetic acid also decomposes via the reverse reaction (where peracetic acid is produced from acetic acid and hydrogen peroxide using a mineral acid catalyst). In the absence of catalyst, this reverse reaction, which is actually slightly endothermic (absorbs a small amount of heat), proceeds very slowly. Refrigerated storage is recommended to minimize the decomposition of peracetic acid.

Hazardous Decomposition or By-products: Peracetic acid decomposes exothermically (91.6 kJ/mole is evolved), particularly at temperatures >55 deg C, forming acetic acid and oxygen upon decomposition.

Hazardous Polymerization: Will not occur.

Conditions to Avoid: Open flames, elevated temperatures and other sources of heat.

Incompatibility (materials to avoid):

- Heavy metals, transitions metals and their salts cause catalytic decomposition.
- Concentrated acids or alkali, reducing agents, dirt, ash and rust may cause spontaneous decomposition.
- Contact with organic material, for example wood, paper and textiles may cause fire.
- Peracetic acid reacts violently with chlorides forming chlorine gas.

SECTION 11 - Toxicological Information

Acute toxicity:

Ingestion:	LD50(rat) = 1,175 mg/Kg PAA solution (2% PAA, 7%H_2O_2, 19% HOAc)
Inhalation:	LC50(rat) = 590 mg/m^3 PAA solution (15% PAA, 15% H_2O_2, 25% HOAc)
Skin contact:	LD50(rat) = 12,000 mg/Kg PAA solution (2% PAA, 7% H2O2, 19% HOAc)

Local effects:

Inhalation: Severely irritating to respiratory tract and may cause inflammation and pulmonary edema. Symptoms are cough, dizziness or sore throat. Higher concentration may have lethal effect.

Ingestion: Ingestion causes burning necrosis of the mucous membranes of mouth, esophagus and stomach. Rapid liberation of oxygen may cause gastric distension and bleeding may lead to severe damage to the stomach. Risk of fatal damage if ingestion is substantial and medical treatment is delayed.

Skin contact: Short contact with the skin causes general burning with discoloration of affected area and erythema, blistering and necrosis may occur. Corrosive to skin (rabbit).

Eye contact:	Contact with eyes may produce corneal injury and irreversible damage. Severely irritating to the eye (rabbit).
Specific effects:	
Sensitization:	Not sensitizing to the skin (guinea-pigs)
Mutagenicity:	In vitro: Positive result in Ames test (*Salmonella typhimurium*) In vivo: No significant effects on mice (micronuclear test).
Carcinogenicity:	Not carcinogen to the skin (mouse 0.2 - 2.0% PAA). PAA is not listed as carcinogen by IARC, NTP or OSHA.
Reproduction effects and teratogenicity:	Decreased reproduction in tests on rats (dose 0.2-1 g/kg).

SECTION 12 - Ecological Information

Mobility:	
Air	Low volatility at ambient temperatures.
Water	Significant solubility and mobility
Soil	No significant adsorption
Persistence / degradability:	Peracetic acid is rapidly reacted to non-toxic substances (water, carbon dioxide, oxygen)
Bioaccumulation:	Peracetic acid is not bioaccumulated
Ecotoxicity:	In general, peracetic acid (PAA) causes effects on aqueous organisms at concentrations higher than 1 mg/L. Freshwater organisms have a greater sensitivity than marine organisms. PAA is an active bactericide in concentrations over 5 mg/L. The chronic toxicity of PAA is probably negligible due to reactions via hydrogen peroxide and acetic acid to non-toxic compounds (water, carbon dioxide, oxygen). Fish: 48 h LC50 (*Oncorhynchus mykiss*) = 18 mg/L PAA solution (15% PAA, 25% H2O2, 25%HAc) Crustacean: 24 h LC50 (*Daphnia magna*) = 6.6 mg/L PAA solution (15% PAA, 25% H2O2, 25%HAc)

SECTION 13 - Disposal Considerations

Dispose of in a manner consistent with Federal, State, and Local regulations.

RCRA: Under RCRA, it is the responsibility of the user to determine, at the time of disposal, whether the product meets RCRA criteria for hazardous waste.

Other Disposal Considerations: Responsibility for proper waste disposal rests with the generator of the waste. Dispose of any waste material in accordance with applicable regulations. Note that these regulations may also apply to empty containers, liner and rinsate. Processing, use dilution or contamination of this product may cause its physical and chemical properties to change.

Waste product: If sufficiently diluted, peracetic acid may be discharged to an approved sewer
Contaminated packaging: Packages should be rinsed with water prior to disposal.

Note: The information provided here is for the product as supplied. Use and/or alterations to the product, such as

mixing with other materials may significantly change the characteristics of the material and alter the RCRA classification and the proper disposal methods.

SECTION 14 - Transportation Information

Description	Designation	Reference
Proper Shipping Name:	Organic peroxide Type C, liquid	49 CFR §173.225 (c)(2)(iv)(A)
UN Identification:	UN 3103	49 CFR §172.101
Packing Group:	PG II	49 CFR §172.101
Hazard Classifications:	Organic Peroxide Class 5.2	49 CFR §172.101
Secondary Name (Technical Name):	peroxyacetic acid	none
Approved packaging x container size:	Fiberboard Box x 0.25 liter	49 CFR §173.212-178.503
Packing Instruction	500	IATA 5.5

Proper labeling and placards include the following:

Organic peroxide Type C, liquid, UN 3103, PG II, Class 5.2
(peroxyacetic acid)

SECTION 15 - Regulatory Information

National Regulations (US)

TSCA Inventory 8(b): Yes

SARA Title III Sec. 302/303 Extremely Hazardous Substances (40 CFR355): Yes
Reportable Quantity: Not known
Threshold Planning Quantity: Not known

SARA Title III Sec. 311/312 (40 CFR 370):
Hazard Category: Fire Hazard, Immediate Health Hazard
Threshold planning quantity: Not known

SARA Title III Sec. 313 Toxic Chemical Emissions Reporting (40 CFR 372): Yes

CERCLA Hazardous Substance (40CFR Part 302)
Not known

State Component Listing: No data

National Regulations (Canada) Canadian NDSL/DSL Registration: DSL

WHMIS Classification: C Oxidizing
E Corrosive
F Dangerously Reactive

Labeling according to Directive 1999/45/EC.

Symbols	O	Oxidizing
	C	Corrosive
	X_i	Irritant
	N	Environmentally dangerous substance
Phrases R	7	May cause fire
	20/21/22	Harmful by inhalation, in contact with skin and if swallowed
	35	Causes severe burns
	36/37/38	Irritating to eyes, respiratory system and skin
Phrases S	3/7	Keep container tightly closed in cool place.
	36/37/39	Wear suitable protective clothing, gloves, and eye/face protection.
	45	In case of accident or if you feel unwell, seek medical advice immediately (Show label where possible).
	26	In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.

SECTION 16 - Other Information

NFPA Ratings: Health - 3 Flammability - 0 Reactivity -3 Other - OX

SECTION 17 - Legends, Nomenclature, Abbreviations

ACGIH	American Conference of Government Industrial Hygienists
C	Corrosive
CASRN	Chemical Abstracts Service Registry Number
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act
DIN	Deutsches Institut für Normung e.V. (German Institute for Standardization, similar to US ANSI)
DOT	Department Of Transportation
DSL	Domestic Substance List
EC	European Community
EMS	Emergency Management System
HMIS	Hazardous Material Identification System, or Hazardous Material Information System
H_2O_2	Hydrogen peroxide
HOAc	Acetic Acid
IARC	International Agency for Research on Cancer
ID	Identification
IMDG	International Maritime Dangerous Goods
IMO	International Maritime Organization [code] (see IMDG, CFR 49 DOT)
ISTA	International Safe Transit Association
LD50	Lethal Dose 50% Population
LEL	Lower Explosion Limit
LFL	Lower Flammability Limit
MSHA	Mine Safety and Health Administration
N	Environmentally dangerous substance

N/A, N.A.	Not Applicable
N/D, N.D.	Not Determined or None Determined
N/E, N.E.	Not Established or None Established
NA nnnn	North America proper shipping name code numbers for domestic transportation only in US, Canada
NAERG	North American Emergency Response Guidebook
NFPA	National Fire Protection Association
NIOSH	National Institute for Occupational Safety and Health
nos , n.o.s.	Not Otherwise Stated
NTP	National Toxicity Program
OSHA	Occupational Safety and Health Administration
O	Oxidizing
PAA	Peracetic acid
PEL	Permissible Exposure Limit
PG	Packing Group
PPE	Personal Protective Equipment
RCRA	Resource Conservation and Recovery Act
RQ	Reportable Quantity
RSPA	Research and Special Programs Administration (under DOT for Hazardous Materials)
SADT	Self-Accelerating Decomposition Temperature
SARA	Superfund Amendments and Reauthorization Act
SCBA	Self Contained Breathing Apparatus
STEL	Short Term Exposure Limit
UN	United Nations Committee of Experts on the Transportation of Dangerous Goods
UN nnnn	United Nations proper shipping name identification code numbers
TDG	Transport Of Dangerous Goods Act (Canada)
TSCA	Toxic Substances Control Act
TWA	Time-weighted average
UEL	Upper Explosion Limit
UFL	Upper Flammability Limit
UN	United Nations Committee of Experts on the Transportation of Dangerous Goods
WHMIS	Workplace Hazardous Materials Information System
X_I	Irritant

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Safety Data Sheet
GHS-Compliant
May be used to comply with
OSHA's Hazard Communication Standard
29 CFR 1910.1200. Standard must be
consulted for specific requirements.

REAGENT CHEMICAL & RESEARCH, INC.
115 US Hwy 202 Ringoes, NJ 08551

PRODUCT IDENTITY	Safety Data Sheet Revision Date - January 7, 2014
Hydrochloric Acid, 20° or 22° Baume	

Section 1 - Identification

Product Name	CAS #
Hydrochloric Acid	7647-01-0
Synonym	Chemical Formula
Muriatic Acid	HCl
Chemical Name	Chemical Family
Hydrochloric Acid Solution	Inorganic Acid
Product Use	
Acidification, pH Adjustment	
Manufacturer/Supplier Name	Address
Reagent Chemical & Research, Inc.	115 US Hwy 202 Ringoes, NJ 08551
General Information	Country
1-908-284-2800	United States
Emergency Telephone	Transportation Emergency Number
1-409-899-3400	CHEMTREC 1-800-424-9300

Section 2 - Hazards Identification

GHS Classification:

HEALTH	PHYSICAL
Acute Toxicity, Oral - Hazard Category 1	Corrosive to Metals - Hazard Category 1
Serious Eye Damage - Hazard Category 1	
Skin Corrosion - Hazard Category 1	

Sensitisation, Respiratory - Hazard Category 1

Acute Toxicity, Inhalation - Hazard Category 1

GHS Label Elements:

SYMBOLS: corrosion, health hazard, aspiration toxicity

Signal Word: DANGER

Section 2 - Hazards Identification (continued)

GHS Label:

Hazard Statements	*Precautionary Statements*
Causes severe skin burns & eye damage	Do not breathe mist/vapors
Fatal if swallowed (oral)	Avoid skin contact
Fatal if inhaled (mist, vapor)	Keep container tightly closed
May cause allergic or asthmatic symptoms	Wear respiratory protection, protective gloves
or breathing difficulties if inhaled	and eye/face protection
May be fatal if swallowed & enters airway	Use only in a well-ventilated area
Causes serious eye damage	Store container tightly closed in cool/well
May be corrosive to metals	ventilated area
	Wash thoroughly after handling

Section 3 - Composition / Information on Ingredients

Component Description	Percent	CAS #
Hydrogen Chloride	26.00 - 37.00	7647-01-0
Water	63.00 - 74.00	7732-18-5

EXPOSURE LIMITS/REGULATORY INFORMATION

Substance	PEL	TLV	STEL	TWA	CEILING
Hydrogen Chloride	C-7 mg/m3	C-2 ppm	50 ppm	N/D	5 ppm
Water	N/D	N/D	N/D	N/D	N/D

N/D - Not Determined C = Ceiling Level

Section 4 - First Aid Measures

General

If a known exposure occurs or is suspected, immediately initiate the recommended procedures below. Simultaneously contact a physician, or the nearest Poison Control Center. Inform the person contacted of the type and extent of exposure, describe the victim's symptoms and follow the advice given. For additional information, call day or night, Reagent Chemical (409) 899-3400 or Chemtrec (800) 424-9300.

Inhalation

Remove from contaminated atmosphere. If breathing has ceased, clear the victim's airway and start mouth-to-mouth artificial respiration, which may be supplemented by the use of a bag-mask respirator, or a manually-triggered, oxygen supply capable of delivering 1 liter/second or more. If the victim is breathing, oxygen may be administered from a demand-type or continuous-flow inhalator, preferably with a physician's advice. Contact a physician immediately.

Section 4 - First Aid Measures (continued)

Eye Contact

Immediately flush the eyes with large quantities of running water for 15 minutes. Hold the eyelids apart during the flushing to ensure rinsing of the entire surface of the eyes and lids with water. DO NOT attempt to neutralize with chemical agents. Obtain medical attention as soon as possible. Oils or ointments should not be used. Continue the flushing for an additional 15 minutes if the physician is not available.

Skin Contact

Immediately remove contaminated clothing under a safety shower. Flush all affected areas with large amounts of water for 15 minutes. DO NOT attempt to neutralize with chemical agents. Obtain medical advice.

Ingestion

DO NOT induce vomiting. Immediately give large quantities of water or milk, if available. If vomiting does occur, give fluids again. Never give anything by mouth to an unconscious person. Call a physician or the nearest Poison Control Center.

Medical Conditions Generally Aggravated by Exposure

Hydrogen Chloride will aggravate breathing disorders

Note to Physician

Attending Physician should treat exposed patients symptomatically

Section 5 - Fire Fighting Measures

Extinguishing Method

Not Applicable, use water to dilute spills and to flush them away from ignition sources.

Unusual Fire and Explosion Hazards

Non-flammable, but Hydrochloric Acid reacts with metals.

Special Firefighting Procedures

Non-flammable, but Hydrochloric Acid reacts with all metals, except gold and platinum, with rapid evolution of Hydrogen which is flammable and explosive in air. Firefighters exposed to Hydrochloric Acid vapors should wear Scott Air-Pak, or equivalent. Hydrogen Chloride vapors are extremely irritating to the respiratory tract and may cause breathing difficulty.

Section 6 - Accidental Release Measures

Steps to be Taken in Case Material is Released or Spilled

Spills or discharges into the environment involving large quantities of Hydrochloric Acid should be controlled and cleaned-up according to a pre-determined, affirmative written Spill Prevention and Control Program. For assistance in developing a SPCP contact your nearest Reagent Sales Office. Refer to Section 15 for spill/release reporting information.

Spills should be handled immediately by neutralization and dilution of the spilled product by the use of Soda Ash (Sodium Carbonate), Lime (Calcium Hydroxide), or Limestone (Calcium Carbonate) with large amounts of water. For an interior (inside a closed space) spill be aware that the use of Soda Ash, Lime and Limestone will evolve heat and carbon dioxide and that ample ventilation must be provided.

Section 6 - Accidental Release Measures (continued)

Waste Disposal
Under Federal RCRA, it is the responsibility of the user of products to determine, at the time of disposal, whether the product falls under RCRA as a hazardous waste. This is because product uses, transformations, mixtures, etc. may render the resulting end-product hazardous.

Container Disposal
Containers should be cleaned of residual product before disposal. Empty containers should be disposed of in accordance with all applicable laws and regulations.

Section 7 - Handling and Storage

Handling
Chemical goggles and full face shield must be worn at all times by personnel exposed to or handling Hydrochloric Acid. The use of a NIOSH approved cartridge respirator or a Scott Air-Pak should be used by all personnel exposed.

Storage
Store containers in a cool, dry location away from direct sunlight, sources of intense heat, or where freezing may occur. Store material in acid-proof container. Keep container tightly closed when not in use. Keep container away from incompatible materials. All loading, unloading, and storage equipment must be inspected prior to any transfer operations are initiated.

General Comments
Impervious clothing, gloves, footwear and head gear must be worn at all times by personnel exposed to or handling Hydrochloric Acid.

Precautions to be Taken in Handling and Storage
Make sure all personnel involved in housekeeping and spill clean-up follow good Industrial Hygiene practices and wear proper protective equipment.

Section 8 - Exposure Controls / Personal Protection

EXPOSURE LIMITS

Substance	PEL	TLV	STEL	TWA	CEILING
Hydrogen Chloride	C-7 mg/m3	C-5 ppm	50 ppm	N/D	5 ppm
Water	N/D	N/D	N/D	N/D	N/D

N/D - No Data Available C = Ceiling Level

Respiratory Protection
Maintain airborne contaminate levels below listed guidelines. Use with adequate ventilation. Use a mechanical fan or vent area to scrubber. Use NIOSH approved respiratory protection if exposure limits are exceeded.

Ventilation		
	Local Exhaust: If PEL exceeded	Special: Vent fumes to appropriate scrubber
	Mechanical (General): If PEL exceeded	Other: Not Applicable

Skin Protection
Wear neoprene rubber gloves to minimize skin contact. Additional protection may be necessary to prevent skin contact including use of apron, face shield, boots or full body protection. A safety shower should be located in the work area.

Eye Protection
Splash goggles or safety glasses. Face shields are recommended. Eye-wash stations should be available where eye contact can occur.

Section 8 - Exposure Controls / Personal Protection (continued)

Other Protection
Use body protection appropriate for task. An apron or other impermeable body protection is suggested. Full body chemical protection is recommended for emergency response procedures.

Section 9 - Physical and Chemical Properties

Boiling Point	230 F	Specific Gravity (H2O = 1)	1.13 - 1.19
Vapor Pressure (mm Hg)	50 - 60 mm	Freezing Point	.-12 F to -63 F
Vapor Density (AIR = 1)	N.A.	Density	9.48 - 9.61

Solubility in Water
miscible

Appearance and Odor
Clear/Slightly yellow with a sharp pungent odor

Section 10 - Stability and Reactivity

Stability	Unstable		Conditions to Avoid Hydrochloric Acid is extremely reactive. Avoid contact with
	Stable	X	metal surfaces and oxidizing agents.

Incompatibility (Materials to Avoid)
Hydrochloric Acid is chemically stable when properly contained and handled. It is a strong mineral acid and reacts with many metals and metal oxides and hydroxides to form the equivalent metal chloride. It reacts with zeolites and other silicious compounds to form Hydrosilicic Acid; it reacts with carbonates to form Carbon Dioxide and Water. It is oxidized by Oxygen or electrolysis to form Chlorine, a lethal, poisonous gas. It reacts with alkaline compounds to form a neutral salt. It is a hydrolyzing agent for carbohydrates, esters and other compounds. It's reaction with most metals will produce Hydrogen, an explosive gas. Violent reactions will result when Hydrochloric Acid Reacts with acetic anhydride, 2-aminoethanol, ammonium hydroxide, calcium phosphide, chlorosulfonic acid, ethylene diamine, ethylene imine, oleum (fuming sulfuric acid), perchloric acid, beta propiolactone, propylene oxide, sodium hydroxide, sulfuric acid, uranium phosphide and vinyl acetate. This listing is not all-inclusive.

Hazardous Decomposition or By-products
Extreme heat may cause the product to decompose, producing toxic fumes which may include chlorine compounds.

Hazardous Polymerization	May Occur		Conditions to Avoid Extreme heat and contact with incompatible materials
	Will Not Occur	X	

Section 11 - Toxicological Information

Route(s) of Entry:	Inhalation?	Skin?	Ingestion?
	Yes	Yes	Yes

Health Hazards (Acute and Chronic)

Hydrogen Chloride, both as a gas and in a solution as Hydrochloric Acid, is a corrosive substance and can cause severe and painful burns on contact with any part of the body or if taken internally. The mucous membranes of the eyes and the upper respiratory tract are especially susceptible to the irritating effects of high atmospheric concentrations of Hydrogen Chloride. The gas or vapor is so penetrating and pungent that when high concentrations do occur, those exposed should immediately leave the contaminated area.

Carcinogenicity:	NTP?	IARC Monographs?	OSHA Regulated?
	No Data Available	No Data Available	No Data Available

Signs and Symptoms of Exposure

Exposure to Hydrochloric acid may cause severe burns at the contact points

Medical Conditions Generally Aggravated by Exposure

Exposure to fumes may aggravate dermatitis and breathing disorders.

Toxicology

Hydrogen Chloride

Inhalation Data

Human LCLo - 1300 ppm/30 min

Rat LC_{50} - 4701 ppm/30 min

Oral (rabbit)

LD_{50} - 900 mg/kg

Mutagenic Effects

Inhalation: 100 ppm/24 hrs (Chromosome damage)

Oral: 100 ppm (Chromosome damage)

Parental: 20 mg (Cytogenic effects)

Section 12 - Ecological Information

Ecological Toxicity

Animals exposed to hydrochloric acid solution will experience tissue damage, burns and may be killed. Plants contaminated with hydrochloric acid solutions of low pH may be adversely effected or destroyed. High concentrations have been shown to be detrimental to aquatic life. A release into a body of water will kill fish and other aquatic life.

Other Ecological Information

Hydrochloric acid is stable and found naturally in the environment. All work practices should be aimed at eliminating environmental contamination.

Chemical Fate Information

Hydrochloric acid is naturally occurring in the environment.

Other Regulatory Information

No other regulatory information is available on this product.

Section 13 - Disposal Considerations

As sold, this product, when discarded or disposed of, is a hazardous waste according to Federal regulations (40 CFR 261). It is listed as Hazardous Waste Number D002, listed due to its corrosivity. The transportation, treatment and disposal of this waste material must be conducted in compliance with 40 CFR 262, 263, 264, 268 and 270. Disposal can occur only in properly permitted facilities. Refer to state and local statutes for any additional requirements, as they may differ from Federal laws.

Section 13 - Disposal Considerations (continued)

Waste Disposal
Under Federal RCRA, it is the responsibility of the user of products to determine, at the time of disposal, whether the product falls under RCRA as a hazardous waste. This is because product uses, transformations, mixtures, etc. may render the resulting end-product hazardous.

Container Disposal
Containers should be cleaned of residual product before disposal. Empty containers should be disposed of in accordance with all applicable laws and regulations.

Section 14 - Transport Information

Regulated Material
Hydrochloric Acid is defined as hazardous by the US DOT and Transport Canada

North American Emergency Response Guide Book
ID # 1789 Guide #157 2008 & 2012 Revision

DOMESTIC SHIPPING INFORMATION

Proper Shipping Name	Hydrochloric Acid	Hazard Classification	Corrosive
UN/NA Identification	UN 1789	Hazard Class	Class 8
DOT Labels Required	Corrosive	Packaging Group	II

INTERNATIONAL SHIPPING INFORMATION

Proper Shipping Name	Hydrochloric Acid	Hazard Classification	Corrosive
UN/NA Identification	UN 1789	Hazard Class	Class 8
Labels Required	Corrosive	Packaging Group	II

Section 15 - Regulatory Information

U.S. Federal Regulations

Comprehensive Environmental Response and Liability Act of 1980 (CERCLA):

Chemical Name: Hydrochloric Acid CAS # 7647-01-0 RQ - 5000 lbs

Toxic Substances Control Act (TSCA):

All components of this product are included on the TSCA inventory

OSHA Hazard Communication Standard Classification:

Corrosive as defined by the OSHA Hazard Communication Standard.

Clean Water Act (CWA):

Chemical Name: Hydrochloric Acid CAS # 7647-01-0 Listed as Hazardous

No chemical components listed as Priority pollutants or Toxic pollutants

Clean Air Act (CAA):

Hydrochloric acid, CAS 7647-01-0, is listed as a hazardous air pollutant (HAP)

US Environmental Protection Agency Risk Management Plan (RMP) Regulated:

No, Hydrochloric acid solution under 37% is not regulated

Superfund Amendments and Reauthorization Act (SARA) Title III Information:

SARA Section 302: Hydrochloric Acid CAS # 7647-01-0 TPQ 5000 lb EPCRA RQ

SARA Section 313: Hydrochloric Acid CAS # 7647-01-0

Section 15 - Regulatory Information (continued)

National Sanitation Foundation Limits (ANSI/NSF Standard 60):

Maximum Drinking Water Use Concentration - 40 mg/l

Scale and Corrosion Control at Maximum 40 mg/l

State Regulations

California Safe Drinking Water Act (Prop 65) Listing:

No ingredients listed in this section

California Right to Know Act:

Chemical Name: Hydrochloric Acid CAS # 7647-01-0

New Jersey Right to Know Act:

Chemical Name: Hydrochloric Acid CAS # 7647-01-0

Chemical Name: Water CAS # 7732-18-5

Massachusetts Right to Know Act Substance List (MSL)::

Chemical Name: Hydrochloric Acid CAS # 7647-01-0

Pennsylvania Right to Know Act Hazardous Substance List:

Chemical Name: Water CAS # 7732-18-5

Chemical Name: Hydrochloric Acid CAS # 7647-01-0

International Regulations

Canadian Domestic Substance List (DSL) Inventory Listing:

Chemical Name: Hydrochloric Acid CAS # 7647-01-0

Canadian Ingredient Disclosure List

Chemical Name: Hydrochloric Acid CAS # 7647-01-0

Canadian Workplace Hazardous Materials Information System (WHMIS):

Class E: Corrosive material

This product has been classified according to the hazard criteria of the CPR and the MSDS contains all of the information required by the CPR

European Inventory of Existing Chemicals (EINECS):

Chemical Name: Hydrochloric Acid EINECS # 231595?

EU Labeling in Accordance with EC Directives:

Hazard Symbols: C

EU Risk (R) and Safety (S) Phrases:

R23/24/25: Toxic by inhalation, in contact with skin and if swallowed

R37/38: Irritating to respiratory system and skin

R41: Risk of serious damage to eyes

S36/37: Wear suitable protective clothing and gloves

S45: In case of accident or if you feel unwell, seek medical advice immediately

S53: Avoid exposure - obtain special instructions before use

S61: Avoid release to the environment. Refer to safety data sheet

Section 15 - Regulatory Information (continued)

Japanese Minister of International Trade and Industry (MITI) Inventory Listing:

Chemical Name: Hydrochloric Acid SECTION STRUCTURE # 1-324

Australian Inventory of Chemical Substances (AICS) Listing:

Chemical Name: Hydrochloric Acid CAS # 7647-01-0

US Census Bureau - Foreign Trade Identification

Chemical Name: Hydrochloric Acid HTS & Schedule B # 2806.10.0000

Section 16 - Other Information

Created By	MSDS Revision Date
Product Safety - 6/1/98	January 7, 2014
MSDS Revision Number	**Revision Indicator**
Revision # 009	Hazard Statement Alignment

MSDS Contact
Robert Dritschel 908-284-2800

Does Product Contain, or is Manufactured with, CFC's?
No

National Fire Protection Association (NFPA) Ratings:
Health - 3 Flammability - 0 Instability - 0 Other Hazard Information - ACID

Hazardous Material Identification System (HMIS):
Health - 3 Flammability - 0 Physical Hazard - 0 Protective Equipment - X

North American Emergency Response Guide Book
ID # 1789 Guide #157 2008 & 2012 Revision

Disclaimer of Liability

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Avista TECHNOLOGIES

Vitec® 3000
SAFETY DATA SHEET

1. Company and Product Identification

1.1	Identification – Product Name:	**Vitec® 3000**
1.2	Other means of identification Synonym:	Organo-phosphorous compounds Mixture, none
1.3	Recommended Use Of The Chemical and Restrictions On Use:	Reverse osmosis membrane antiscalant Use only as directed on the label.
1.4	Name, Address, And Telephone Number Of The Manufacturer, Or Other Responsible Party:	**AVISTA TECHNOLOGIES** 140 Bosstick Street San Marcos, CA 92069 (760) 744-0536
	Competent Person email address	klindsey@avistatech.com
1.5	24 Hour Emergency No.:	1-800-424-9300 (United States) 1-703 527-3887 (International Collect)

NSF

CERTIFIED BY NSF INTERNATIONAL TO NSF/ANSI 60 AS STANDARD DRINKING WATER TREATMENT CHEMICAL FOR USE IN REVERSE OSMOSIS SYSTEMS AT A MAXIMUM LEVEL OF 7 mg/l.

2. HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW: *This product is amber to light yellow water-based solution with a light disinfectant odor. This product may irritate contaminated tissue. This product is neither reactive nor flammable.*

Physical Hazards Summary	None
Potential Health Hazards Summary	Skin corrosion/irritation, Category 2 H315 Causes skin irritation H319 Causes serious eye irritation
Potential Ecological Effects Summary	None

2.1 Classification Of Product

U.S. OSHA classification	Skin, eye irritant
Classification as per EC 1272/2008 (CLP/GHS)	Skin corrosion/irritation, Category 2 H315 Causes skin irritation H319 Causes serious eye irritation
WHMIS classification	E, corrosive D2B - Poisonous and infectious material - Other effects – Toxic

Hazardous Materials Information System (HMIS) Rating

Flammability	**0**
Physical Hazard	**0**
Protective Equipment	**C**

2.2 Label Elements OSHA/GHS

General Warnings	P101	If medical advice is needed, have product container or label at hand.
	P102	Keep out of reach of children.
	P103	Read label before use
Signal Word	WARNING!	
Hazard statements	H315	Causes skin irritation
	H 319	Causes serious eye irritation
	H335	May cause respiratory irritation
Precautionary statements	P271	Use only outdoors or in a well-ventilated area.
	P281	Use personal protective equipment as required.
	P312	IF SWALLOWED: Call a POISON CENTER or doctor/physician if you feel unwell.
	P302/P352	
	P261	Avoid breathing dust/ fume/ gas/ mist/ vapours/ spray.
	P305 + P351 + P338	P305 + P351 + P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

Hazard pictograms

2.3 Unclassified Hazards None

2.4 Ingredients with unknown acute toxicity None

3. COMPOSITION and INFORMATION ON INGREDIENTS

Chemical name **CAS #** **EINECS #**	**% w/w**	**US OSHA**	**GHS/EU CLP**	**WHMIS**
Deflocculant & Sequestrant Proprietary	*20-30*	Irritant	Skin corrosion/irritation, Category 2 H315 Causes skin irritation H319 Causes serious eye irritation H335 May cause respiratory irritation P261 Avoid breathing dust/ fume/ gas/ mist/ vapors/ spray. P305 + P351 + P338 IF IN EYES: Rinse cautiously with water for	E, corrosive D2B - Poisonous and infectious material - Other effects - Toxic

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			several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Keep out of reach of children. Keep away from food, drink and animal feeding stuffs. Avoid contact with skin. Avoid contact with eyes. In case of contact with eyes, rinse immediately with plenty of water and seek medical advice. Wear suitable protective clothing. If swallowed, seek medical advice immediately and show this container or label	
Chelate Agent Proprietary	*10-20*	Corrosive	Skin corrosion/irritation, Category 2 H319 Causes serious eye irritation P305 + P351 + P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Keep out of reach of children. Keep away from food, drink and animal feeding stuffs. Avoid contact with skin. Avoid contact with eyes. In case of contact with eyes, rinse immediately with plenty of water and seek medical advice. Wear suitable protective clothing. If swallowed, seek medical advice immediately and show this container or label	E, corrosive
pH adjustment agent Proprietary	*20-30*	Low Hazard	H314 Causes severe burns P305 + P351 + P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Keep out of reach of children. Keep away from food, drink and animal feeding	Not regulated

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			Avoid contact with skin. Avoid contact with eyes. In case of contact with eyes, rinse immediately with plenty of water and seek medical advice. Wear suitable protective clothing. If swallowed, seek medical advice immediately and show this container or label	
Water or other chemicals do not contribute to any additional hazards of this product	balance	N/A	N/A	N/A

NE = Not Established. C = Ceiling Limit. See Section 16 for Definitions of Terms Used.

4. FIRST-AID MEASURES

4.1 Description of Necessary Measures

Skin exposure: If this product contaminates the skin, immediately begin decontamination with running water. Remove exposed or contaminated clothing, taking care not to contaminate eyes. Victim should seek immediate medical attention if any adverse exposure symptoms develop.

Eye exposure: If this product enters the eyes, open victim's eyes while under gently running water. Use sufficient force to open eyelids. Have victim "roll" eyes. Minimum flushing is for 15 minutes. Victim must seek medical attention.

Inhalation: If vapors, mists, or sprays of this product are inhaled, remove victim to fresh air. If necessary, use artificial respiration to support vital functions. Remove or cover gross contamination to avoid exposure to rescuers.

Ingestion: If this product is swallowed, CALL PHYSICIAN OR POISON CONTROL CENTER FOR MOST CURRENT INFORMATION. DO NOT INDUCE VOMITING. Have victim rinse mouth with water, if conscious. Never induce vomiting or give a diluent (e.g., water) to someone who is unconscious, having convulsions, or unable to swallow. If contaminated individual is convulsing, maintain an open airway and obtain immediate medical attention.

4.2 Most Important Symptoms/Effects: Immediate: Inhalation exposure may cause coughing or sneezing. Symptoms of skin and eye contact may include redness and irritation. Ingestion may cause stomach pains, cramps, and gastritis.

Delayed: Prolonged or repeated skin overexposure to this product may cause dermatitis (dry, red skin). Symptoms may include tingling, redness, and visible injury.

4.3 Indication Of Immediate Medical Attention And Special Treatment Needed, If Necessary: **TARGET ORGANS:** Acute: Skin, eyes. Chronic: Skin.

Victims of chemical exposure must be taken for medical attention if any adverse effects occur. Rescuers should be taken for medical attention if necessary. Take a copy of label and MSDS to physician or health professional with victim.

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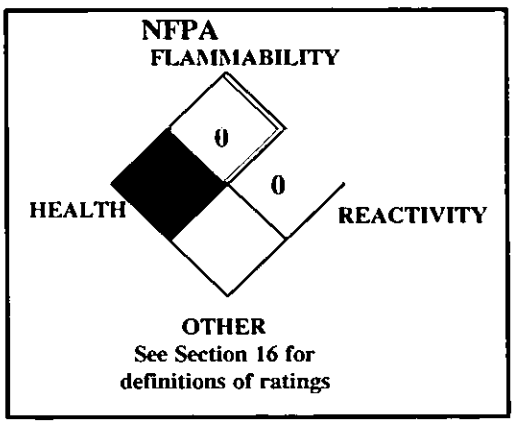
5. FIRE-FIGHTING MEASURES

Flammable properties — Non-flammable aqueous solution



Flash Point °C (°F): Not applicable.

Autoignition Temperature °C (°F): Not applicable.

Flammable Limits (in air by volume, %):
Upper: Not applicable.
Lower: Not applicable.

5.1 Suitable And Unsuitable Extinguishing Media: This material will not contribute to the intensity of a fire. Use extinguishing material suitable to the surrounding fire.

Water spray	YES	Carbon dioxide	YES
Foam	YES	Dry chemical	YES
Halon	YES	Other	YES

5.2 Specific Hazards Arising From Chemical: When involved in a fire, this material may decompose and produce irritating fumes and toxic gases (e.g., carbon monoxide, carbon dioxide, and phosphorous oxides).

Explosion Sensitivity to Mechanical Impact: Not sensitive.
Explosion Sensitivity to Static Discharge: Not sensitive.

5.3 Special Protective Equipment And Precautions For Fire-Fighters: Incipient fire responders should wear eye protection. Structural firefighters must wear Self-Contained Breathing Apparatus and full protective equipment. Move containers from fire area if it can be done without risk to personnel. If possible, prevent runoff water from entering storm drains, bodies of water, or other environmentally sensitive areas.

6. ACCIDENTAL RELEASE MEASURES

6.1 Personal Precautions: Uncontrolled releases should be responded to by trained personnel using pre-planned procedures. Proper protective equipment should be used. In case of a spill, clear the affected area and protect people.

Protective equipment: For small releases (< 5 gallons), clean up spilled liquid wearing gloves, goggles, faceshield, and suitable body protection. The minimum Personal Protective Equipment recommended for response to non-incidental releases (more than 5 gallons) should be Level B: triple-gloves (neoprene gloves and nitrile gloves over latex gloves), chemical resistant suit and boots, hard hat, and Self-Contained Breathing Apparatus.

Emergency procedures: Monitoring must indicate that exposure levels are below those provided in Section 3 (Composition and Information on Ingredients) and that oxygen levels are above 19.5% before anyone is permitted in the area without Self-Contained Breathing Apparatus.

6.2 Methods and Materials for Containment and Cleaning Up: Soak up or wet vacuum spilled liquid. Neutralize residue with sodium bicarbonate or other neutralizing agent for dilute acids. Decontaminate the area thoroughly. Test area with litmus paper to ensure neutralization. Place all spill residues in a suitable container. Dispose of in accordance with applicable U.S. Federal, State, or local procedures, or appropriate local standards (see Section 13, Disposal Considerations).

7. HANDLING and STORAGE

7.1 Precautions for Safe Handling

All employees who handle this material should be trained to handle it safely. Open containers carefully on a stable surface. Empty containers may contain residual liquid; therefore, empty containers should be handled with care.

As with all chemicals, avoid getting this product ON YOU or IN YOU. Wash thoroughly after handling this product. Do not eat or drink while handling this material. Avoid generating mists and sprays of this product. Remove contaminated clothing immediately.

During equipment maintenance follow practices indicated in Section 6 (Accidental Release Measures) to decontaminate equipment or clean-up small spills. Make certain that application equipment is locked and tagged-out safely if necessary. Collect all rinsates and dispose of according to applicable U.S. Federal, State, or local procedures or appropriate local standards.

7.2 Conditions For Safe Storage

Store containers in a cool, dry location, away from direct sunlight, sources of intense heat, or where freezing is possible. Store away from incompatible materials. Material should be stored in secondary containers, or in a diked area, as appropriate. Storage and use areas should be covered with impervious materials. Keep container tightly closed when not in use. If appropriate, post warning signs in storage and use areas. Inspect all incoming containers before storage, to ensure containers are properly labeled and not damaged.

Incompatibilities: Strong bases, strong oxidizers, very strong acids, water reactive materials.

8. EXPOSURE CONTROLS - PERSONAL PROTECTION

8.1 Control Parameters

CHEMICAL NAME	CAS #	EXPOSURE LIMITS IN AIR					
		ACGIH-TLV		OSHA-PEL			
		TWA mg/m^3	STEL mg/m^3	TWA mg/m^3	STEL mg/m^3	IDLH mg/m^3	OTHER mg/m^3
Deflocculant & Sequestrant	Proprietary	NE	NE	NE	NE	NE	NE
Chelate agent	Proprietary	NE	NE	NE	NE	NE	NE
pH adjustment agent	Proprietary	NE	2 mg/m^3 C	2 mg/m^3 C	NE	NE	NIOSH REL 2 mg/m^3 C

NE = Not Established. C = Ceiling Limit. See Section 16 for Definitions of Terms Used.

8.2 Appropriate Engineering Controls.

Use with adequate ventilation to ensure exposure levels are maintained below the limits provided in this Section or as low as reasonably achievable. Ensure eyewash/safety shower stations are available near areas where this product is used.

8.3 Personal Protective Equipment

Respiratory protection: None needed under normal conditions of use. Use NIOSH approved respirators if ventilation is inadequate to control mists or vapor. If respiratory protection is needed, use only protection authorized in the U.S. Federal OSHA Standard (29 CFR 1910.134), applicable U.S. State regulations, or the applicable local standards. Oxygen levels below 19.5% are considered IDLH by OSHA. In such atmospheres, use of a full-face piece pressure/demand SCBA or a full-face piece, supplied air respirator with auxiliary self-contained air supply is required under OSHA's Respiratory Protection Standard (1910.134-1998).

Eye protection: Use approved safety goggles or safety glasses, as described in OSHA 29 CFR 1910.133. Splash goggles with a faceshield may be needed if splash hazards exist.

Hand protection: Wear chemical impervious gloves (e.g., Neoprene or Nitrile).

Body protection: If needed, use body protection appropriate for task (e.g., Tyvek suit, rubber apron) to protect from splashes and sprays.

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9. PHYSICAL and CHEMICAL PROPERTIES

Appearance	This product is a clear, amber liquid with a light disinfectant odor.		
Odor	Light disinfectant odor	Odor Threshold	N/A
Melting Point °C (°F)	Similar to water	pH (as supplied)	10.7-11.8
Initial Boiling Point °C (°F)	100	Boiling Point Range °C (°F)	N/A
Flammability	Non-flammable	Evaporation Rate (water = 1)	Similar to water
Vapor Density (air = 1)	Similar to water	Vapor Pressure mm Hg @ 20°C:	18
Solubility (in water)	Soluble	Relative density (water = 1)	1.2 – 1.3
Viscosity	Similar to water	Oil-Water Partition Coefficient	N/A
Decomposition Temperature	N/A		
How To Detect This Substance (Warning Properties):	The color and odor may act as warning properties associated with this product.		

10. STABILITY and REACTIVITY

10.1	Reactivity	Not considered reactive.
10.2	Chemical Stability	Stable
10.3	Possibility of hazardous reactions	Hazardous polymerization will not occur.
10.4	Conditions to avoid	Avoid mixing with incompatible materials.
10.5	Incompatible Materials	Strong bases, strong oxidizers, very strong acids, water reactive materials.
10.6	Hazardous Decomposition Products	Thermal decomposition of this product may generate carbon monoxide, carbon dioxide, and phosphorus oxides.

11. TOXICOLOGICAL INFORMATION

11.1	Information on Toxicological Effects			
	Toxicity data for hazardous ingredients	Oral LD_{50} mg/kg	Dermal LD_{50} mg/kg	Inhalation LD_{50} mg/kg
	Deflocculant & Sequestrant	N/A	N/A	N/A
	Chelate agent	LD_{50} (Oral-Rat) 2100 mg/kg LD_{50} (Skin-Rabbit) > 6310 mg/kg LD_{50} (Oral-Quail) > 2510 mg/kg LD_{50} (Oral-Duck) > 2510 mg/kg TDLo (Oral-Rat) 1302 mg/kg/31 days-intermittent: Kidney, Urethra, Bladder: other changes in urine composition; Nutritional and Gross Metabolic: weight loss or decreased weight gain, changes in sodium.	Standard Draize Test (Skin-Rabbit) 500 mg/24 hours Standard Draize Test (Eye-Rabbit) 100 mg: Moderate	N/A
	pH adjustment agent	LD_{50} (Intraperitoneal-Mouse) 40 mg/kg LDLo (Oral-Rabbit) 500 mg/kg Cytogenetic Analysis (Parenteral-Grasshopper) 20 mg Cytogenetic Analysis (Hamster-Lung) 10 mmol/L Cytogenetic Analysis (Hamster-Ovary) 16 mmol/L	Standard Draize Test (Eye-Monkey) 1%/24 hours: Severe Standard Draize Test (Skin-Rabbit) 500 mg/24 hours: Severe Standard Draize Test (Eye-Rabbit) 400 *g: Mild Standard Draize Test (Eye-Rabbit) 1%: Severe Standard Draize Test (Eye-Rabbit) 50 *g/24 hours: Severe Standard Draize Test (Eye-Rabbit) 1 mg/24 hours: Severe Rinsed with water (Eye-Rabbit) 1 mg/30 seconds: Severe	N/A

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	Potential routes of exposure	Inhalation, skin contact, eye contact
	Potential effects of acute over-exposure	Inhalation exposure may cause tingling, coughing, sneezing, and difficulty breathing. Symptoms of skin and eye contact may include redness and irritation. Ingestion may cause stomach pains, cramps, and gastritis.
	Potential effects of chronic over-exposure	Prolonged or repeated skin overexposure to this product may cause dermatitis (dry, red skin). Symptoms may include tingling, redness, and visible injury.
	Symptoms of over-exposure	Immediate: Inhalation exposure may cause tingling, coughing, sneezing, and difficulty breathing. Symptoms of skin and eye contact may include redness and irritation. Ingestion may cause stomach pains, cramps, and gastritis. Delayed: Prolonged or repeated skin overexposure to this product may cause dermatitis (dry, red skin). Symptoms may include tingling, redness, and visible injury.
	Conditions aggravated by over-exposure	Preexisting dermatitis, other skin conditions, and respiratory conditions may be aggravated by exposures to this product.
	Recommendations to physicians:	Treat symptoms and eliminate exposure.
	Irritation	YES This product can be irritating to contaminated tissue.
	Sensitization	NO

Carcinogenicity	NTP	IARC	US OSHA	CAL OSHA	67/548 EEC Annex I
	NO	NO	NO	NO	NO

Mutagenicity	NO
Reproductive toxicity	NO
Biological Exposure Index	N/A
Other potential health effects	Currently, there are no Biological Exposure Indices (BEIs) for any component of this product.

12. ECOLOGICAL INFORMATION

ALL WORK PRACTICES MUST BE AIMED AT ELIMINATING ENVIRONMENTAL CONTAMINATION.

12.1	Ecotoxicity	LC_{50}, mg/L	EC_{50}, mg/L
Vitec® 3000 NSF			
	Aquatic	LC50 (*Mysidopsis bahai*) > 1000 mg/L 7 days	EC_{50} (*Daphnia magna*) 48 hours = >1000 mg/L NOEC (*Daphnia magna*) 48 hours = 1000 mg/L
	Terrestrial	N/A	N/A
12.2	Persistence and Degradability	The components of this product decompose in soil and water.	
12.3	Bioaccumulative Potential	The components of this product are not expected to bioaccumulate.	
12.4	Mobility in Soil	Moderately mobile.	
12.5	Other Adverse Ecological Effects	This product may be harmful to aquatic life if large volumes of it are released into an aquatic environment.	

13. DISPOSAL CONSIDERATIONS

Preparing Wastes of this Product for Disposal	Waste disposal must be in accordance with appropriate U.S. Federal, State, and local regulations or with local regulations. This product, if unaltered by the handling, may be disposed of by treatment at a permitted facility or as advised by your local waste regulatory authority.
Disposal of Contaminated Packaging	Cleaned containers can be recycled or disposed of as non-contaminated waste, if authorized by your local authorities. Dispose of containers as required by local regulations.

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U.S. EPA Waste Number Not applicable.

14. TRANSPORTATION INFORMATION

THIS MATERIAL IS NOT HAZARDOUS AS DEFINED BY 49 CFR 172.101 BY THE U.S. DEPARTMENT OF TRANSPORTATION.

14.1	UN Number	Not applicable
14.2	UN Proper Shipping Name	Not applicable
14.3	Transport Hazard Class(es)	Not applicable
	Transport label(s) required	Not applicable
14.4	Packing Group	Not applicable
14.5	Marine Pollutant	Not applicable
	NA Emergency Response Guide Number (2008)	Not applicable
14.6	Transport in Bulk (Annex II of MARPOL 73/78 and IBC Code)	Not applicable
14.7	Special Transport Precautions	Not applicable
	National Motor Freight Classification	#70

International Air Transport Association

UN Number	Not applicable
UN Proper Shipping Name	Not applicable
Transport Hazard Class(es)	Not applicable
Transport label(s) required	Not applicable
Packing Group	Not applicable
IATA Emergency Response Code	Not applicable
Excepted Quantity	Not applicable
Packaging Instructions	Not applicable

International Maritime Organization

UN Number	Not applicable
UN Proper Shipping Name	Not applicable
Transport Hazard Class(es)	Not applicable
Transport label(s) required	Not applicable
Packing Group	Not applicable
Marine Pollutant	Not applicable
NA Emergency Response Guide Number (2008)	Not applicable
Transport in Bulk (Annex II of MARPOL 73/78 and IBC Code)	Not applicable

15. SAFETY, HEALTH and ENVIRONMENTAL REGULATIONS SPECIFIC FOR THE PRODUCT

PROGRAM	Deflocculant & Sequestrant	Chelate agent	pH adjustment agent
US EPA PROGRAMS			
Clean Air Act Hazardous Air Pollutants	NO	NO	NO
Safe Drinking Water Act	NO	NO	NO
RCRA F, K, P, U or D-lists	NO	NO	D002
SARA 302 RQ	NO	NO	1000 lbs
SARA 302 TPQ	NO	NO	NO
SARA 313 LISTED	NO	NO	NO
SARA CHEMICAL CATEGORIES			

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SARA 311/312 ACUTE	YES	YES	NO
SARA 311/312 CHRONIC	NO	NO	NO
SARA 311/312 FIRE	NO	NO	NO
SARA 311/312 PRESSURE	NO	NO	NO
SARA 311/312 REACTIVITY	NO	NO	NO
EPA EXTREMELY HAZARDOUS SUBSTANCE	NO	NO	NO
CALIFORNIA SAFE DRINKING WATER ACT (Proposition 65)			
This product does not contain any chemical listed on the California Safe Drinking Water Act list (Proposition 65)			
US OSHA PROGRAMS			
PEL	NO	NO	2 mg/m^3 C
PSM	NO	NO	NO
CHEMICAL SECURITY PROGRAMS			
DHS CFATS	NO	NO	NO
CHEMICAL WEAPONS CONVENTION			
	NO	NO	NO
US DRUG ENFORCEMENT ADMINISTRATION			
DEA Controlled Substances	NO	NO	NO
CHEMICAL INVENTORY PROGRAMS			
WHMIS	NO	NO	E
DSL	YES	YES	YES
NDSL	N/A	N/A	N/A
REACH Pre-registered List	YES	YES	YES
TSCA	YES	YES	YES
European Inventory of Existing Commercial Chemical Substances (EINECS)	YES	YES	YES
EU No-Longer Polymers List (NLP)	NO	NO	NP
EEC Classification Packaging, and Labeling of Dangerous Substances(Annex 1)	Skin corrosion/irritation, Category	Skin corrosion/irritation, Category 2	Skin corrosion/irritation, Category 2
Philippines	YES	YES	YES
Japan	YES	YES	YES
Australia	YES	YES	YES
Korea	YES	YES	YES
China	NO	NO	YES
New Zealand Inventory of Chemicals	YES	YES	YES

16. OTHER INFORMATION

16.1	Original Preparation	14 Nov 2005; update 20 February 2014
16.2	Revision History	13 March 2013 Reformatted to GHS Requirements
16.3	Prepared by	ADVANCED CHEMICAL SAFETY, Inc. PO Box 152329 San Diego, CA 92195 (858)-874-5577
16.4	Date of Printing	April 22, 2015

DEFINITIONS OF TERMS

16.5	A large number of abbreviations and acronyms appear on a MSDS. Some of these which are commonly used include the following:	
	Section 2	**GHS:** Global Harmonization System **OSHA:** U.S. Occupational Safety and Health Administration. **CLP:** Classification and Packaging **WHMIS:** Workplace Hazardous Materials Information System **STOT:** Specific Target Organ Toxicity
	Section 3	**CAS #:** Chemical Abstract Service index number **EINECS #:** European Chemical Substances Information System index number
	Section 5	**NFPA:** Nation Fire Protection Association **Health Hazard: 0** (material that on exposure under fire conditions would offer no hazard beyond that of ordinary combustible materials); **1** (materials that on exposure under fire conditions could cause irritation or minor residual injury); **2** (materials that on intense or continued exposure under fire conditions could cause temporary incapacitation or possible residual injury); **3** (materials that can on short exposure could cause serious temporary or residual injury); **4** (materials that under very short exposure could cause death or major residual injury). **Flammability Hazard** **Reactivity Hazard:** Refer to definitions for "Hazardous Materials Identification System". **Flash Point:** Minimum temperature at which a liquid gives off sufficient vapors to form an ignitable mixture with air. **Autoignition Temperature:** The minimum temperature required to initiate combustion in air with no other source of ignition. **LEL:** The lowest percent of vapor in air, by volume, that will explode or ignite in the presence of an ignition source. **UEL:** The highest percent of vapor in air, by volume, that will explode or ignite in the presence of an ignition source.
	Section 8	**ACGIH** - American Conference of Governmental Industrial Hygienists, a professional association which establishes exposure limits. **TLV** - Threshold Limit Value - an airborne concentration of a substance which represents conditions under which it is generally believed that nearly all workers may be repeatedly exposed without adverse effect. The duration must be considered, including the 8-hour Time Weighted Average (**TWA**), the 15-minute Short Term Exposure Limit, and the instantaneous Ceiling Level (**C**). Skin absorption effects must also be considered **PEL** - Permissible Exposure Limit - This exposure value means exactly the same as a TLV, except that it is enforceable by OSHA. The OSHA Permissible Exposure Limits are based in the 1989 PELs and the June, 1993 Air Contaminants Rule (Federal Register: 58: 35338-35351 and 58: 40191). Both the current PELs and the vacated PELs are indicated. The phrase, "Vacated 1989 PEL," is placed next to the PEL which was vacated by Court Order. **IDLH** - Immediately Dangerous to Life and Health - This level represents a concentration from which one can escape within 30-minutes without suffering escape-preventing or permanent injury. **The DFG - MAK** is the Republic of Germany's Maximum Exposure Level, similar to the U.S. PEL. **NIOSH** is the National Institute of Occupational Safety and Health, which is the research arm of the U.S. Occupational Safety and Health Administration (**OSHA**). NIOSH issues exposure guidelines called **R**ecommended **E**xposure **L**evels (**RELs**). When no exposure guidelines are established, an entry of **NE (Not Established)** is made for reference.
	Section 11	**LD_{50}** : Lethal Dose (solids & liquids) which kills 50% of the exposed animals; **LC_{50}** : Lethal Concentration (gases) which kills 50% of the exposed animals; **ppm:** Concentration expressed in parts of material per million parts of air or water; **mg/m^3** : Concentration expressed in weight of substance per volume of air; **mg/kg:** Quantity of material, by weight, administered to a test subject, based on their body weight in kg **IARC** - the International Agency for Research on Cancer; **NTP** - the National Toxicology Program, **RTECS** - the Registry of Toxic Effects of Chemical Substances, **OSHA** and **CAL/OSHA**. IARC and NTP rate chemicals on a scale of decreasing potential to cause human cancer with rankings from 1 to 4. Subrankings (2A, 2B, etc.) are also used. **TDLo**, the lowest dose to cause a symptom and **TCLo** the lowest concentration to cause a symptom; **TDo, LDLo**, and **LDo**, or **TC, TCo, LCLo**, and **LCo**, the lowest dose (or concentration) to cause lethal or toxic effects. **BEI** - Biological Exposure Indices, represent the levels of determinants which are most likely to be observed in specimens collected from a healthy worker who has been exposed to chemicals to the same extent as a worker with inhalation exposure to the TLV.
	Section 12	**LC_{50}:** The lowest concentration in water which kills 50% of the test subjects. **EC_{50}:** The Effect Concentration in water at which 50% of the test species if affected.
	Section 13	**US EPA Hazardous Waste Codes**: refer to 40 CFR 261.20
	Section 14	**DOT**: US Department of Transportation **IATA**: International Air Transport Association **IMO**: International Maritime Organization **MARPOL:** International Convention for the Prevention of Pollution From Ships, 1973 as modified by the Protocol of 1978 **IBC Code** : Merchant Shipping Code
	Section 15	**RCRA**: US Resource Conservation and Recovery Act **SARA:** US Superfund Amendments and Reauthorization Act **PSM**: US OSHA Process Safety Management **CFATS:** US Department of Homeland Security Chemical Facility Anti-terrorism Standard **DSL:** Canadian Domestic Substances List **NDSL:** Canadian Non-Domestic Substances List **REACH**: European Registration, Evaluation, Authorization and Restriction of Chemicals list **TSCA:** US Toxic Substances Control Act

Safety Data Sheet

Westlake Chemical

Section 1: Identification of the Substance/Mixture and of the Company/Undertaking

1.1 Product identifier

Product Name • **Sodium Hydroxide Solution - 50%**

Synonyms • Solutions of Caustic; Solutions of Caustic Soda; Solutions of Lye; Solutions of Sodium hydrate

CAS Number • 1310-73-2

1.2 Relevant identified uses of the substance or mixture and uses advised against

Relevant identified use(s) • Neutralizing agent, industrial cleaning, pulp and bleaching, soap manufacturing

1.3 Details of the supplier of the safety data sheet

Manufacturer • Westlake Vinyls, Inc.
P.O. Box 527
2468 Industrial Parkway Calvert City, KY 42029
United States
www.westlake.com

Telephone (General) • 270-395-4151

1.4 Emergency telephone number

Manufacturer • (800) 424-9300 - Chemtrec - Transportation emergency

Section 2: Hazards Identification

EU/EEC
According to Regulation (EC) No 1272/2008 (CLP)/REACH 1907/2006 [amended by 453/2010]
According to EU Directive 67/548/EEC (DSD) or 1999/45/EC (DPD)

2.1 Classification of the substance or mixture

CLP • Skin Corrosion 1A - H314

DSD/DPD • Corrosive (C)
R35

2.2 Label Elements

CLP

DANGER

Hazard statements • H314 - Causes severe skin burns and eye damage.

Precautionary statements

Prevention • P260 - Do not breathe mist/vapors/spray.
P264 - Wash thoroughly after handling.
P280 - Wear protective gloves/protective clothing/eye protection/face protection.

Response • P304+P340 - IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing.
P303+P361+P353 - IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower.
P310 - Immediately call a POISON CENTER or doctor/physician.
P363 - Wash contaminated clothing before reuse.
P321 - Specific treatment, see supplemental first aid information.
P305+P351+P338 - IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P301+P330+P331 - IF SWALLOWED: Rinse mouth. Do NOT induce vomiting.

Storage/Disposal • P405 - Store locked up.
P501 - Dispose of content and/or container in accordance with local, regional, national, and/or international regulations.

DSD/DPD

Risk phrases • R35 - Causes severe burns.

Safety phrases • S36 - Wear suitable protective clothing.
S37 - Wear suitable gloves.
S39 - Wear eye/face protection.
S45 - In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).

2.3 Other Hazards

CLP • According to Regulation (EC) No. 1272/2008 (CLP) this material is considered hazardous.

DSD/DPD • This product is considered dangerous according to the European Directive 67/548/EEC.

United States (US)

According to OSHA 29 CFR 1910.1200 HCS

2.1 Classification of the substance or mixture

OSHA HCS 2012 • Skin Corrosion 1B - H314
Serious Eye Damage 1 - H318

2.2 Label elements

OSHA HCS 2012

DANGER

Hazard statements • Causes severe skin burns and eye damage. - H314
Causes serious eye damage - H318

Precautionary statements

Prevention • Do not breathe mist/vapors/spray. - P260
Wash thoroughly after handling. - P264
Wear protective gloves/protective clothing/eye protection/face protection. - P280

Response • IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing. - P304+P340
IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower. - P303+P361+P353
Immediately call a POISON CENTER or doctor/physician. - P310
Wash contaminated clothing before reuse. - P363
IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. - P305+P351+P338
IF SWALLOWED: Rinse mouth. Do NOT induce vomiting. - P301+P330+P331

Storage/Disposal • Store locked up. - P405
Dispose of content and/or container in accordance with local, regional, national, and/or international regulations. - P501

2.3 Other hazards

OSHA HCS 2012 • Under United States Regulations (29 CFR 1910.1200 - Hazard Communication Standard), this product is considered hazardous.

Canada

According to WHMIS

2.1 Classification of the substance or mixture

WHMIS • Corrosive - E

2.2 Label elements

WHMIS

• Corrosive - E

2.3 Other hazards

WHMIS • In Canada, the product mentioned above is considered hazardous under the Workplace Hazardous Materials Information System (WHMIS).

Section 3 - Composition/Information on Ingredients

3.1 Substances

Composition				
Chemical Name	**Identifiers**	**%**	**LD50/LC50**	**Classifications According to Regulation/Directive**
Sodium hydroxide	**CAS:**1310-73-2 **EC Number:**215-185-5 **EU Index:**011-002-00-6	50%	NDA	**EU DSD/DPD:** Annex VI, Table 3.2: C R35 **EU CLP:** Annex VI, Table 3.1: Skin Corr. 1A, H314 **OSHA HCS 2012:** Skin Corr. 1B; Eye Dam. 1

3.2 Mixtures

- Material does not meet the criteria of a mixture in accordance with Regulation (EC) No 1272/2008.

Section 4 - First Aid Measures

4.1 Description of first aid measures

Inhalation
- Administer oxygen if breathing is difficult. Do not use mouth-to-mouth method if victim inhaled the substance; give artificial respiration with the aid of a pocket mask equipped with a one-way valve or other proper respiratory medical device. Give artificial respiration if victim is not breathing. Move victim to fresh air.

Skin
- For minor skin contact, avoid spreading material on unaffected skin. In case of contact with substance, immediately flush skin with running water for at least 20 minutes. Remove and isolate contaminated clothing and shoes.

Eye
- In case of contact with substance, immediately flush eyes with running water for at least 20 minutes.

Ingestion
- If swallowed, rinse mouth with water (only if the person is conscious) Do NOT induce vomiting. Do not use mouth-to-mouth method if victim ingested the substance. Obtain medical attention immediately if ingested.

4.2 Most important symptoms and effects, both acute and delayed

- Refer to Section 11 - Toxicological Information.

4.3 Indication of any immediate medical attention and special treatment needed

Notes to Physician
- All treatments should be based on observed signs and symptoms of distress in the patient. Consideration should be given to the possibility that overexposure to materials other than this product may have occurred.

Section 5 - Firefighting Measures

5.1 Extinguishing media

Suitable Extinguishing Media
- In case of fire use media as appropriate for surrounding fire.

Unsuitable Extinguishing Media
- No data available

5.2 Special hazards arising from the substance or mixture

Unusual Fire and Explosion Hazards
- In contact with moisture or water sufficient heat may be generated to ignite adjacent combustible materials.
  Sodium hydroxide solutions can react violently when in contact with chlorinated hydrocarbons and metals such as aluminum, zinc or materials galvanized with zinc with resultant generation of hydrogen.

Hazardous Combustion Products
- Non-combustible, substance itself does not burn but may decompose upon heating to produce corrosive fumes.

5.3 Advice for firefighters

- Structural firefighters' protective clothing provides limited protection in fire situations ONLY; it is not effective in spill situations where direct contact with the substance is possible.
  Wear chemical protective clothing that is specifically recommended by the manufacturer. It may provide little or no thermal protection.
  Wear positive pressure self-contained breathing apparatus (SCBA).
  SMALL FIRES: Move containers from fire area if you can do it without risk.

Section 6 - Accidental Release Measures

6.1 Personal precautions, protective equipment and emergency procedures

Personal Precautions
- Do not walk through spilled material. Wear appropriate personal protective equipment, avoid direct contact. Do not touch damaged containers or spilled material unless wearing

appropriate protective clothing. Ventilate enclosed areas.

Emergency Procedures • Keep unauthorized personnel away. Stay upwind. Do not get water inside container.

6.2 Environmental precautions

• Prevent entry into waterways, sewers, basements or confined areas.

6.3 Methods and material for containment and cleaning up

Containment/Clean-up Measures • Absorb with earth, sand or other non-combustible material.
Transfer the spilled material to caustic resistant containers labeled: CORROSIVE
With careful handling, dilute acid, preferable acetic acid, may be used to neutralize final traces of caustic.
Flush the cleaned area with water.
LARGE SPILLS: Dike far ahead of liquid spill for later disposal.

6.4 Reference to other sections

• Refer to Section 8 - Exposure Controls/Personal Protection and Section 13 - Disposal Considerations.

Section 7 - Handling and Storage

7.1 Precautions for safe handling

Handling • Handle and open container with care. Use only with adequate ventilation. Use caution when combining with water; DO NOT add water to corrosive liquid, ALWAYS add corrosive liquid to water while stirring to prevent release of heat, steam and fumes. Wear appropriate personal protective equipment, avoid direct contact. Do not breathe mist, vapours and/or spray. Do not get in eyes, on skin, or on clothing. Wash thoroughly with soap and water after handling and before eating, drinking, or using tobacco.

7.2 Conditions for safe storage, including any incompatibilities

Storage • Keep container tightly closed. Store in a cool/low-temperature, well-ventilated place. Store separate from the normal work area and away from materials that react with sodium hydroxide. Use corrosion resistant structural materials and lighting and ventilation systems in the storage area.

7.3 Specific end use(s)

• Refer to Section 1.2 - Relevant identified uses.

Section 8 - Exposure Controls/Personal Protection

8.1 Control parameters

Exposure Limits/Guidelines				
	Result	ACGIH	NIOSH	OSHA
Sodium hydroxide (1310-73-2)	TWAs	Not established	Not established	2 mg/m3 TWA
	Ceilings	2 mg/m3 Ceiling	2 mg/m3 Ceiling	Not established

8.2 Exposure controls

Engineering Measures/Controls • Good general ventilation should be used. Ventilation rates should be matched to conditions. If applicable, use process enclosures, local exhaust ventilation, or other engineering controls to maintain airborne levels below recommended exposure limits. If exposure limits have not been established, maintain airborne levels to an acceptable level.

Personal Protective Equipment

Respiratory • Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or symptoms are experienced.

Eye/Face • Wear eye/face protection - Chemical goggles, - Full face shield.

Skin/Body • Wear appropriate gloves. Wear protective clothing

Environmental • Follow best practice for site management and disposal of waste.

Exposure Controls

Key to abbreviations
ACGIH = American Conference of Governmental Industrial Hygiene
NIOSH = National Institute of Occupational Safety and Health
OSHA = Occupational Safety and Health Administration
TWA = Time-Weighted Averages are based on 8h/day, 40h/week exposures

Section 9 - Physical and Chemical Properties

9.1 Information on Physical and Chemical Properties

Material Description			
Physical Form	Liquid	Appearance/Description	Colorless to gray, syrupy liquid with a mild, pungent odor.
Color	Colorless to gray.	Odor	Mild, slightly pungent.
Odor Threshold	Data lacking		
General Properties			
Boiling Point	148 C(298.4 F)	Melting Point	Data lacking
Decomposition Temperature	Data lacking	pH	14
Specific Gravity/Relative Density	1.49 Water=1 @ 65.6 C(150.08 F)	Water Solubility	Soluble
Viscosity	Data lacking	Explosive Properties	Data lacking
Oxidizing Properties:	Data lacking		
Volatility			
Vapor Pressure	19 mmHg (torr) @ 65.5 F(18.6111 C)	Vapor Density	Data lacking
Evaporation Rate	Data lacking	Volatiles (Vol.)	50 %
Flammability			
Flash Point	Data lacking	UEL	Data lacking
LEL	Data lacking	Auto ignition	Data lacking
Flammability (solid, gas)	Not relevant.		
Environmental			
Octanol/Water Partition coefficient	Data lacking		

9.2 Other Information

- No additional physical and chemical parameters noted.

Section 10: Stability and Reactivity

10.1 Reactivity

- No dangerous reaction known under conditions of normal use.

10.2 Chemical stability

- Stable

10.3 Possibility of hazardous reactions

- Hazardous polymerization will not occur.

10.4 Conditions to avoid

- Incompatible materials. Excess heat.

10.5 Incompatible materials

- This product reacts with water generating heat. This product reacts violently or explosively with chlorinated hydrocarbons. It attacks leather and wool resulting in destruction of those materials and possible chemical exposure

to the individual. Caustic solutions can generate hydrogen gas on contact with aluminum, zinc or materials galvanized with zinc.

10.6 Hazardous decomposition products

- No data available.

Section 11 - Toxicological Information

11.1 Information on toxicological effects

Sodium Hydroxide Solution - 50% 1310-73-2								
Test Type	**Dosage**	**Route**	**Species**	**Duration**	**Results**	**Test Class**	**Target Organs**	**Comments**
Irritation	= 1 %	Eye	Rabbit	NDA	NDA	Severe irritation, reversible	NDA	NDA
Irritation	= 500 mg	Skin	Rabbit	24 Hour(s)	NDA	Severe irritation, reversible	NDA	NDA

GHS Properties	Classification
Acute toxicity	**EU/CLP**•Classification criteria not met **OSHA HCS 2012**•Classification criteria not met
Aspiration Hazard	**EU/CLP**•Classification criteria not met **OSHA HCS 2012**•Classification criteria not met
Carcinogenicity	**EU/CLP**•Classification criteria not met **OSHA HCS 2012**•Classification criteria not met
Germ Cell Mutagenicity	**EU/CLP**•Classification criteria not met **OSHA HCS 2012**•Classification criteria not met
Skin corrosion/Irritation	**EU/CLP**•Skin Corrosion 1A **OSHA HCS 2012**•Skin Corrosion 1B
Skin sensitization	**EU/CLP**•Classification criteria not met **OSHA HCS 2012**•Classification criteria not met
STOT-RE	**EU/CLP**•Classification criteria not met **OSHA HCS 2012**•Classification criteria not met
STOT-SE	**EU/CLP**•Classification criteria not met **OSHA HCS 2012**•Classification criteria not met
Toxicity for Reproduction	**EU/CLP**•Classification criteria not met **OSHA HCS 2012**•Classification criteria not met
Respiratory sensitization	**EU/CLP**•Classification criteria not met **OSHA HCS 2012**•Classification criteria not met
Serious eye damage/Irritation	**EU/CLP**•Classification criteria not met **OSHA HCS 2012**•Serious Eye Damage 1

Route(s) of entry/exposure
- Inhalation, Skin, Eye, Ingestion

Potential Health Effects

Inhalation

Acute (Immediate)
- May cause corrosive burns - irreversible damage.

Chronic (Delayed)
- Repeated or prolonged exposure to corrosive fumes may cause bronchial irritation with chronic cough.

Skin

Acute (Immediate)
- Causes severe skin burns and eye damage.

Chronic (Delayed)
- Repeated or prolonged exposure to corrosive materials will cause dermatitis.

Eye

Acute (Immediate)
- Causes serious eye damage.

Chronic (Delayed) • Repeated or prolonged exposure to corrosive materials or fumes may cause conjunctivitis.

Ingestion

Acute (Immediate) • May cause irreversible damage to mucous membranes.

Chronic (Delayed) • Repeated or prolonged exposure to corrosive materials or fumes may cause gastrointestinal disturbances.

Section 12 - Ecological Information

12.1 Toxicity

Sodium Hydroxide Solution - 50%			1310-73-2		
Dosage	**Species**	**Duration**	**Results**	**Exposure Conditions**	**Comments**
144 to 276 mg/L	**Fish:** Poecilia reticulata (Guppy)	96 Hour(s)	LC50	NDA	NDA
= 125 mg/L	**Fish:** Gambusia affinis (Western mosquito fish)	96 Hour(s)	LC50	NDA	NDA

12.2 Persistence and degradability

• Material data lacking.

12.3 Bioaccumulative potential

• Material data lacking.

12.4 Mobility in Soil

• Material data lacking.

12.5 Results of PBT and vPvB assessment

• PBT and vPvB assessment has not been carried out.

12.6 Other adverse effects

• No studies have been found.

Section 13 - Disposal Considerations

13.1 Waste treatment methods

Product waste • Dispose of content and/or container in accordance with local, regional, national, and/or international regulations.

Packaging waste • Dispose of content and/or container in accordance with local, regional, national, and/or international regulations.

Section 14 - Transport Information

	14.1 UN number	14.2 UN proper shipping name	14.3 Transport hazard class(es)	14.4 Packing group	14.5 Environmental hazards
DOT	UN1824	Sodium hydroxide solution	8	II	NDA
	14.1 UN number	**14.2 UN proper shipping name**	**14.3 Transport hazard class(es)**	**14.4 Packing group**	**14.5 Environmental hazards**
TDG	UN1824	Sodium Hydroxide Solution	8	II	NDA
IMO/IMDG	UN1824	Sodium Hydroxide Solution	8	II	NDA
IATA/ICAO	UN1824	Sodium Hydroxide Solution	8	II	NDA

14.6 Special precautions for user
- None specified.

14.7 Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code
- Data lacking.

Section 15 - Regulatory Information

15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture

SARA Hazard Classifications
- Acute

Inventory						
Component	CAS	Australia AICS	Canada DSL	Canada NDSL	China	EU EINECS
Sodium hydroxide	1310-73-2	Yes	Yes	No	Yes	Yes

Inventory (Con't.)						
Component	CAS	EU ELNICS	Japan ENCS	Korea KECL	New Zealand	Philippines PICCS
Sodium hydroxide	1310-73-2	No	Yes	Yes	Yes	Yes

Inventory (Con't.)		
Component	CAS	TSCA
Sodium hydroxide	1310-73-2	Yes

Canada

Labor

Canada - WHMIS - Classifications of Substances

•Sodium hydroxide	1310-73-2	E (including 0.04% in aqueous solution, 0.08%, 0.4% in aqueous solution, 2%, 2.5%, 4% in aqueous solution, 5%, 10%, 16%, 20%, 40%, 50% in aqueous solution, 8.7N)

Canada - WHMIS - Ingredient Disclosure List

•Sodium hydroxide	1310-73-2	1 %

Environment

Canada - CEPA - Priority Substances List

•Sodium hydroxide	1310-73-2	Not Listed

Europe

Other

EU - Hazardous Substances Restricted or Prohibited in Electrical Equipment (2011/65/EU) (RoHS)

•Sodium hydroxide	1310-73-2	Not Listed

EU - Inventory of Cosmetic Ingredients Directive (INCI) (76/768/EEC) - Other Ingredients

•Sodium hydroxide	1310-73-2	Buffering; Denaturant

Japan

Environment

Japan - Pollutant Release Transfer Register (PRTR) - Class 1 Substances

•Sodium hydroxide	1310-73-2	Not Listed

Japan - Pollutant Release Transfer Register (PRTR) - Class 2 Substances

•Sodium hydroxide	1310-73-2	Not Listed

Inventory - Japan - Industrial Safety and Health Law Substances (ISHL)

•Sodium hydroxide	1310-73-2	Not Listed

Other Agency Information

Other

CONEG - Model Toxics in Packaging Legislation

•Sodium hydroxide	1310-73-2	Not Listed

United States

Labor

U.S. - OSHA - Process Safety Management - Highly Hazardous Chemicals		
•Sodium hydroxide	1310-73-2	Not Listed
U.S. - OSHA - Specifically Regulated Chemicals		
•Sodium hydroxide	1310-73-2	Not Listed

Environment

U.S. - CAA (Clean Air Act) - 1990 Hazardous Air Pollutants		
•Sodium hydroxide	1310-73-2	Not Listed
U.S. - CAA (Clean Air Act) - Class I Ozone Depletors		
•Sodium hydroxide	1310-73-2	Not Listed
U.S. - CAA (Clean Air Act) - Class II Ozone Depletors		
•Sodium hydroxide	1310-73-2	Not Listed
U.S. - CERCLA/SARA - Hazardous Substances and their Reportable Quantities		
•Sodium hydroxide	1310-73-2	1000 lb final RQ; 454 kg final RQ
U.S. - CERCLA/SARA - Section 302 Extremely Hazardous Substances EPCRA RQs		
•Sodium hydroxide	1310-73-2	Not Listed
U.S. - CERCLA/SARA - Section 302 Extremely Hazardous Substances TPQs		
•Sodium hydroxide	1310-73-2	Not Listed
U.S. - CERCLA/SARA - Section 313 - Emission Reporting		
•Sodium hydroxide	1310-73-2	Not Listed
U.S. - CERCLA/SARA - Section 313 - PBT Chemical Listing		
•Sodium hydroxide	1310-73-2	Not Listed
U.S. - RCRA (Resource Conservation & Recovery Act) - Basis for Listing - Appendix VII		
•Sodium hydroxide	1310-73-2	Not Listed
U.S. - RCRA (Resource Conservation & Recovery Act) - Hazardous Constituents - Appendix VIII to 40 CFR 261		
•Sodium hydroxide	1310-73-2	Not Listed
U.S. - TSCA (Toxic Substances Control Act) - Section 12(b) - Export Notification		
•Sodium hydroxide	1310-73-2	Not Listed

United States - California

Environment

U.S. - California - Proposition 65 - Carcinogens List		
•Sodium hydroxide	1310-73-2	Not Listed
U.S. - California - Proposition 65 - Developmental Toxicity		
•Sodium hydroxide	1310-73-2	Not Listed
U.S. - California - Proposition 65 - Maximum Allowable Dose Levels (MADL)		
•Sodium hydroxide	1310-73-2	Not Listed
U.S. - California - Proposition 65 - No Significant Risk Levels (NSRL)		
•Sodium hydroxide	1310-73-2	Not Listed
U.S. - California - Proposition 65 - Reproductive Toxicity - Female		
•Sodium hydroxide	1310-73-2	Not Listed
U.S. - California - Proposition 65 - Reproductive Toxicity - Male		
•Sodium hydroxide	1310-73-2	Not Listed

15.2 Chemical Safety Assessment

- No Chemical Safety Assessment has been carried out.

Section 16 - Other Information

Last Revision Date • 01/April/2015

Preparation Date • 01/April/2015

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implied, regarding accuracy of the information or the hazards connected with the use thereof. Compliance with all applicable federal, state, and local laws and regulations regarding the use, storage, sale, transport or disposal of this material is the responsibility of the user.

Key to abbreviations

NDA = No data available

Electronic Filing: Received, Clerk's Office 10/31/2022

ILLINOIS ENVIRONMENTAL PROTECTION AGENCY

1021 NORTH GRAND AVENUE EAST, P.O. BOX 19276, SPRINGFIELD, ILLINOIS 62794-9276 • (217) 782-3397
BRUCE RAUNER, GOVERNOR ALEC MESSINA, ACTING DIRECTOR

Memorandum

Date: August 31, 2016

To: Bob Mosher, DWPC Standards

From: Jaime Rabins

Subject: Request for Water Quality Standards Evaluation

An NPDES permit will be drafted for the facility identified below. The following standards related items are requested items to facilitate permit issuance:

☑ **Antidegradation Assessment** ☐ new discharge ☐ expanded ☐ relocated
☐ Additional Parameters of Concern:

☐ **Reasonable Potential/Water Quality Based Effluent Limits Analysis**

☐ **Whole Effluent Biomonitoring Recommendations**

☐ **Ammonia Limits**

	Current Limits	Ave.	Max
Spring/Fall			
Summer			
Winter			

☐ Facility now collects ammonia 5 days per week

☑ **303(d)/BSC Listing or Rating for Receiving Water**

Facility Name: Waukegan Generating Station

NPDES No. IL0002259 **Receiving Waters:** Lake Michigan
County: Lake **NPDES Expiration Date:** March 31, 2020

☑ **Major Facility** ☐ **Minor Facility** **DAF:** MGD
Highest monthly ave. flow: MGD

☐ Copy of NPDES Permit Application/Map forwarded to IDNR on
☐ IDNR Endangered Species Action Report included with received application (copy attached)

Comments, etc: The facility proposes to replace the demineralizers with two 220 gpm RO units.

4302 N. Main St., Rockford, IL 61103 (815)987-7760
595 S. State, Elgin, IL 60123 (847)608-3131
2125 S. First St., Champaign, IL 61820 (217)278-5800
2009 Mall St., Collinsville, IL 62234 (618)346-5120
9511 Harrison St., Des Plaines, IL 60016 (847)294-4000
412 SW Washington St., Suite D, Peoria, IL 61602 (309)671-3022
2309 W. Main St., Suite 116, Marion, IL 62959 (618)993-7200
100 W. Randolph, Suite 10-300, Chicago, IL 60601

PLEASE PRINT ON RECYCLED PAPER

Rabins, Jaime

From: Mosher, Bob
Sent: Wednesday, April 22, 2015 3:10 PM
To: Rabins, Jaime
Subject: FW: chloride and sulfate

Jaime,

I think it is fair to use what the IEPA lab uses for Reporting limits, i.e., minimum detection limits. Chloride = 1 mg/L and sulfate = 10 mg/L.

Bob Mosher
Manager, Water Quality Standards Section
Division of Water Pollution Control
Illinois Environmental Protection Agency
1021 North Grand Ave. East
P.O. Box 19276
Springfield, IL 62794-9276
217/558-2012

From: Rousey, Michelle
Sent: Wednesday, April 22, 2015 3:07 PM
To: Rabins, Jaime
Cc: Mosher, Bob
Subject: chloride and sulfate

Here is a table showing the various chloride and sulfate methods and the applicable concentration ranges:

Parameter	Methodology	Methods	Applicable Range (mg/L)
Chloride	Titrimetric: (silver nitrate)	SM 4500-Cl^- B-1997	0.15-10
	Titrimetric: (Mercuric nitrate)	SM 4500-Cl^- C-1997	Not listed
	Automated (Ferricyanide)	SM 4500-Cl^- E-1997; IEPA Laboratory uses this method.	1-200; IEPA Laboratory reporting limit is 1.
	Potentiometric Titration	SM 4500-Cl^- D-1997	Not listed
	Ion Chromatography	EPA 300.0, Rev. 2.1 (1993)	0.78-26.0
		EPA 300.1-1, Rev. 1.0 (1997)	Not listed
		SM 4110 B-2000	Not listed
		SM 4110 C-2000	Not listed
	Capillary Ion Electrophoresis/ Ultraviolet	SM 4140B-1997	Not listed
Sulfate	Automated colorimetric	EPA 375.2, Rev. 2.0 (1993); IEPA Laboratory uses this method.	3-300 and 0.5-30 (with minor modifications); IEPA Laboratory reporting limit is 10.

		SM 4500-SO_4^{2-} F-1997	10-300
		SM 4500-SO_4^{2-} G-1997	Not listed
	Gravimetric	SM 4500-SO_4^{2-} C-1997	Greater than 10
		SM 4500-SO_4^{2-} D-1997	Not listed
	Turbidimetric	SM 4500-SO_4^{2-} E-1997	Not listed
	Ion Chromatography	EPA 300.0, Rev. 2.1 (1993)	2.85-95.0
		EPA 300.1-1, Rev 1.0 (1997)	Not listed
		SM 4110 B-2000	Not listed
		SM 4110 C-2000	Not listed
	Capillary Ion Electrophoresis/ Ultraviolet	SM 4140B-1997	Not listed

Sources: 40 CFR Part 136 *Guidelines Establishing Test Procedures for the Analysis of Pollutants Under the Clean Water Act: Analysis and Sampling Procedures* for methods.
National Environmental Methods Index (NEMI) for applicable ranges.

For chloride, the Illinois EPA laboratory uses *Standard Methods (SM) for the Examination of Water and Wastewater* SM 4500-Cl^- E and a reporting limit of 1 mg/L.

For sulfate, the Illinois EPA laboratory uses EPA method 375.2 and a reporting limit of 10 mg/L.

Both of these reporting limits are reasonable and can be achieved using the methods (containing applicable ranges) listed in the above table.

Please let me know if you have any questions.

Michelle Rousey
Quality Assurance Officer, Bureau of Water
Discharge Monitoring Report-QA Coordinator

Illinois Environmental Protection Agency
1021 North Grand Avenue East
P.O. Box 19276 (Mail Code 15)
Springfield, IL 62794-9276

(217) 785-3944 - phone
(217) 785-1225 - fax
Michelle.Rousey@illinois.gov

Electronic Filing: Received, Clerk's Office 10/31/2022

ILLINOIS ENVIRONMENTAL PROTECTION AGENCY

1021 NORTH GRAND AVENUE EAST, P.O. BOX 19276, SPRINGFIELD, ILLINOIS 62794-9276 • (217)782-2829
PAT QUINN, GOVERNOR LISA BONNETT, DIRECTOR

Memorandum

Date: 11 September 2014

To: Jaime Rabins

From: Scott Twait

Subject: Midwest Generation - Waukegan -- Antidegradation Assessment
NPDES Permit No. IL0002259 (Lake County)

The subject facility has applied for a modification of the NPDES permit to include wastewater generated as part of an air emission control process and the roof and floor drains associated with the Trona mill building. The subject facility is installing a dry sorbent injection flue gas desulfurization system to minimize atmospheric discharges of sulfur dioxide and acid gasses. Trona ($Na_2CO_3 \bullet NaHCO_3 \bullet 2H_2O$) will be milled and blown into the flue gas ductwork using injection lances. In order to ensure the efficiency of the milling process, the Trona mills and immediately surrounding areas will have to go through daily wash cycles of approximately 100 gallons of water, per wash. This wastewater will only contain Trona, at an approximate concentration of about 3%. All of the fly ash handling system is dry; therefore any Trona that has been used to control SO_2 emissions will be disposed of offsite.

The amount of Trona used at any given time will vary as a function of its effectiveness in controlling SO_2 emissions. The amount of Trona mill washes is a function of the number of Trona mills used for each boiler. At Waukegan Station, once the full Trona injection system is completed, there will be an estimated maximum of 18 washes per day, at 100 gallons of water per wash, for a maximum of 1800 gallons of wash water per day to be introduced into the existing wastewater treatment system. The estimated average Trona mill wash water flow is 800 gallons/day.

However, total suspended solids are not expected in the effluent, due to the high solubility of this product. The wash water from the milling process will undergo setting within the East Yard Basin (Internal Outfall D01) and would then be sent to Outfall 001.

The information in this antidegradation assessment came from the September 2014 antidegradation assessment by Midwest Generation, titled "Waukegan Generating Station – NPDES Permit No. IL0002259 Anti-Degradation Assessment".

Identification and Characterization of the Affected Water Body.

The subject facility discharges to Lake Michigan. The facility has a DAF of 12.0 MGD. Lake Michigan is classified as a Lake Michigan Basin Use Water. Lake Michigan is not listed as a biologically significant stream in the 2008 Illinois Department of Natural Resources Publication *Integrating Multiple Taxa in a Biological Stream Rating System*, nor is it given an integrity rating in that document. Lake Michigan, Waterbody Segment, QLM-01, is listed on the draft 2014 Illinois Integrated Water Quality Report and Section 303(d) List as impaired for fish consumption use with potential causes given as mercury and polychlorinated biphenyls and aesthetic quality use with potential cause given as phosphorus. Aquatic life, public and food processing water supply, primary contact recreation, and secondary contact uses are fully supported. Lake Michigan is not subject to enhanced dissolved oxygen standards.

Identification of Proposed Pollutant Load Increases or Potential Impacts on Uses.

Existing Total Suspended Solids and pH permit limits will continue to be regulated. With the treatment provided within the East Yard Basin, a measurable increase in pH is not expected to occur at Outfall 001.

Fate and Effect of Parameters Proposed for Increased Loading.

Given that negligible, if any, additional pollutant loading would occur as a result of this proposed modification; an adverse impact to the existing uses of the receiving water is not anticipated.

The expected concentration of Trona in the effluent would be non-detectable, and therefore, there will be no measurable pollutant loading to the receiving stream as the result of the proposed wash water, and therefore no impact on existing uses and water quality of the receiving stream.

Purpose and Social & Economic Benefits of the Proposed Activity.

The Trona mill wash water is a byproduct of the advanced air control measures that Waukegan Station will employ to reduce emissions of sulfur dioxide and acid gases. This air emissions control technology installation (the basis of the requested Trona mill washwater addition) would benefit the environment by minimizing the loading of these pollutants to the atmosphere, and subsequently minimizing the atmospheric deposition of these pollutant into the Lake Michigan Basin and other regional watersheds.

Assessments of Alternatives for Less Increase in Loading or Minimal Environmental Degradation.

The facility evaluated applying the Trona washwater around the reclaim area of the coal pile. The reclaim area is where the coal process input point leading directly to the boilers where the coal will be combusted. The facility also evaluated collecting the water and sending it off-site for treatment. Neither of these alternatives was deemed feasible.

Summary Comments of the Illinois Department of Natural Resources, Regional Planning Commissions, Zoning Boards or Other Entities.

On September 9, 2014, the IDNR EcoCAT web-based tool was used and indicated that there were endangered/threatened resources (Illinois Beach INAI Site, Waukegan Beach INAI Site, Illinois Beach Nature Preserve, Bearberry (*Arctostaphylos uva-ursi*), Black-Crowned Night Heron (*Nycticorax nycticorax*), Blanding's Turtle (*Emydoidea blandingii*), Common Tern (*Sterna hirundo*), Least Bittern (*Ixobrychus exilis*), Marram Grass (*Ammophila breviligulata*), Peregrine Falcon (*Falco peregrinus*), Piping Plover (*Charadrus melodus*), Richardson's Rush (*Juncus alpinoarticulatus*), Sea Rocket (*Cakile edentula*), Seaside Spurge (*Chamaesyce polygonifolia*), and Upland Sandpiper (*Bartramia longicauda*))present in the vicinity of the discharge. IDNR evaluated the submittal and determined that impacts to the protected resources are unlikely. IDNR terminated the consultation request on September 11, 2014.

Agency Conclusion.

This preliminary assessment was conducted pursuant to the Illinois Pollution Control Board regulation for Antidegradation found at 35 Ill. Adm. Code 302.105 (antidegradation standard) and was based on the information available to the Agency at the time the draft permit was written. We tentatively find that the proposed activity will result in the attainment of water quality standards; that all existing uses of the receiving stream will be maintained; that all technically and economically reasonable measures to avoid or minimize the

extent of the proposed increase in pollutant loading have been incorporated into the proposed activity; and that this activity will benefit the community at large by minimizing the loading of sulfur dioxide and acid gases to the atmosphere, and subsequently minimizing the atmospheric deposition of these pollutant into the Illinois River and other regional watersheds. Comments received during the NPDES permit public notice period will be evaluated before a final decision is made by the Agency.

cc: Bob Mosher
FOS Region 2 Manager
Des Plaines Regional Office – Surface Water Manager
Chron

Electronic Filing: Received, Clerk's Office 10/31/2022

ILLINOIS ENVIRONMENTAL PROTECTION AGENCY

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PAT QUINN, GOVERNOR JOHN J. KIM, INTERIM DIRECTOR

Memorandum

Date: March 26, 2014

To: Bob Mosher, DWPC Standards

From: Jaime Rabins

Subject: Request for Water Quality Standards Evaluation

An NPDES permit will be drafted for the facility identified below. The following standards related items are requested items to facilitate permit issuance:

☑ **Antidegradation Assessment** ☑ new discharge ☐ expanded ☐ relocated
☐ Additional Parameters of Concern:

☐ **Reasonable Potential/Water Quality Based Effluent Limits Analysis**

☐ **Whole Effluent Biomonitoring Recommendations**

☐ **Ammonia Limits**

	Current Limits	Ave.	Max
Spring/Fall			
Summer			
Winter			

☐ Facility now collects ammonia 5 days per week

☑ **303(d)/BSC Listing or Rating for Receiving Water**

Facility Name: Waukegan Generating Station

NPDES No. IL0002259 **Receiving Waters:**
County: Lake **NPDES Expiration Date:** July 31, 2005

☑ **Major Facility** ☐ **Minor Facility** **DAF:** MGD
Highest monthly ave. flow: MGD

☐ Copy of NPDES Permit Application/Map forwarded to IDNR on
☐ IDNR Endangered Species Action Report included with received application (copy attached)

Comments, etc:
New wastestream of 800 gpd average, 1800 gpd of Trona mill wash water to the East Yard Runoff Ash Basin Treatment System (D01) tributary to Lake Michigan. Roof and floor drains from the proposed Dry Sorbent Injection Building will also be sent to D01.

Rabins, Jaime

From: Wozniak, Julia <Julia.Wozniak@nrgenergy.com>
Sent: Monday, September 08, 2014 8:53 AM
To: Twait, Scott
Cc: Rabins, Jaime
Subject: Antidegradation Assessments for Powerton and Waukegan Stations
Attachments: Powerton Antideg Assessment for Trona Washwater 9-05-2014.pdf; Waukegan Antideg Assessment for Trona Washwater 9-05-2014.pdf

Importance: High

Hi Scott:

As requested, attached are the subject assessments related to the Trona mill washwater NPDES permit modification requests which were submitted to the Agency last year. (Powerton's request was dated February 3, 2013; Waukegan's request was dated September 30, 2013). As indicated in the write-ups, it is critical to have these requested modifications in place before the end of the year, in order for us to meet our CPS commitment for both stations.

Please let me know if you have any questions or need any additional information in order to expedite the NPDES permit modifications, which we understand will be initiated as soon as the final permits are issued.

Thanks for your help regarding this matter!

Julia

nrg
Power to be free

Julia Wozniak
Environmental Program Manager
529 E. 135th Street
Romeoville, Illinois 60446
Office: (815) 372-4622 (no voice mail)
Cell: (312) 925-3184
Email: Julia.Wozniak@nrgenergy.com

Waukegan Generating Station--NPDES Permit No. IL0002259
Anti-Degradation Assessment

Midwest Generation LLC (MWG) has requested the inclusion of the following additional intermittent and de minimis wastewater discharge for the Waukegan Generating Station (the Station) under NPDES Permit No. IL0002259:

- Discharge of Trona mill wash water and associated building floor and roof drains through the East Yard Runoff Basin System (Outfall D01), with final discharge through Outfall 001.

The following paragraphs provide the applicable anti-degradation assessment for the requested modification to the NPDES permit. Given the intermittent and de minimis nature of the proposed additional discharge to the receiving water, the information provided below should be sufficient to satisfy the antidegradation assessment requirements of Section 302.105.

Receiving Water:

The discharge from Outfall 001 flows into the Lake Michigan Basin, which is governed by Lake Michigan Basin water quality standards by the State of Illinois[1]. Because Lake Michigan does not meet the definition of "Outstanding Resource Waters" described in 35 Ill. Admin. Code 302.105(b), nor is it a "High Quality Waters" described in 35 Ill. Admin. Code 302.105(c), the applicable scope of the anti-degradation assessment provided herein is to assess whether the existing uses of the Lake Michigan Basin will be protected and maintained, as described under 35 Ill. Admin. Code 302.105(a). Further, as provided in 35 Ill. Admin. Code 302.105(f), information of the type described in the regulation has been included to the extent necessary to allow the Agency to determine that the existing uses in the Lake Michigan Basin will be protected and maintained.

Identification and Characterization of the Receiving Water Body:

Outfall	Receiving Stream	Latitude	Longitude	Stream Classification	Biological-Stream Characterization
001	Lake Michigan	42° 23' 00" North	87° 48' 15" West	Lake Michigan Basin	Not Rated

Segment QLM-01 receiving the discharge from outfall 001 is on the draft 2012 Illinois Integrated Water Quality Report and Section 303(d) List. The receiving water has not been given an integrity rating or been listed as biologically significant in the 2008 Illinois Department of Natural Resources publication Integrating Multiple Taxa in a Biological Stream Rating System. The impaired designated uses and pollutants causing impairment are tabulated below:

[1] Title 35, Ill. Admin. Code, Part 302, Subpart E

Designated Uses	Pollutants Causing Impairment
Fish Consumption	Mercury and Polychlorinated biphenyls (PCB's)

The Section 303(d) list shows the lake fully supporting Aquatic Life, Public and Food Processing Water Supplies, Primary Contact Recreation, Secondary Contact and Aesthetic Quality.

The minor discharge modification proposed by MWG will still result in maintaining and protecting existing uses in the Lake Michigan Basin and will not result in an increased loading of any of these identified parameters to the receiving stream that would negatively impact the existing uses of the Lake Michigan Basin.

Description of Proposed Incremental Discharge Increase and Potential Impact on Receiving Stream Uses:

Midwest Generation (MWG) has requested a modification to Waukegan's NPDES permit to include the minor sub-wastestream that will be generated once the station's dry sorbent injection flue gas desulfurization (FGD) system is installed—expected on or before December 31, 2014. Use of this system is intended to minimize atmospheric discharges of sulfur dioxide and acid gasses. [The construction work on this project has already been initiated, as part of the company's commitment under the Combined Pollutant Standard (CPS) for Illinois coal-fired generating stations. (Ref: IEPA Construction Permit Numbers: (Ref: IEPA Construction Permit Numbers: 10090034 (Unit 7), issued on December 20, 2013, and 13120007 (Unit 8), issued on April 18, 2014).

Trona ($Na_2CO_3 \bullet NaHCO_3 \bullet 2H_2O$) is a sodium-based naturally occurring mineral that reacts to remove Sulfur Dioxide (SO_2) through an endothermic decomposition process (calcination), followed by an exothermic sulfation process.

A small amount of wastewater will be generated as part of this air emission control process. Trona will be delivered to the station and transferred to storage silos. The Trona will be metered to a pneumatic conveying system that will blow sorbent through a mill and then into the flue gas ductwork using injection lances. In order to ensure the efficiency of the milling process, the Trona mills and immediately surrounding areas will have to go through daily wash cycles of approximately 100 gallons of water, per wash, with a maximum estimated Trona concentration in the wash water of about 3%. (Note that this would consist of dissociated product and service water only, without any sulfate content, since the Trona is not injected into the flue gas ductwork until after it is milled).

Trona is a naturally occurring, non-hazardous substance, and is, in fact, commonly used in a variety of household products, including toothpaste and medicine, as well as industrial water treatment processes. Based on MWG's intended use, it has been determined that the incremental amount of Trona, which would be picked up in the mill wash water (sourced from existing station service water system), would not have any

significant or measureable impact on the final discharge from the station's existing wastewater treatment system, or the quality of the receiving stream.

All of MWG's fly ash handling systems are dry, and all the residuals are trucked off-site for disposal, so there are no other expected impacts to any NPDES-permitted wastestreams as the result of the installation of this dry sorbent FGD system, other than the de minimis contribution of intermittent flow from the roof and floor drains of the Trona system building containment system, to be built on the east side of the former Units 1-5 boiler building.

Under the proposed modification, all intermittent drainage from the Trona system containment will be routed to the East Yard Runoff Basin (Internal Outfall D01, tributary to Outfall 001) through existing station drainage systems which currently collect floor and roof drainage. This is not expected to add significantly to the already small, intermittent wastestream quantity or quality.

The amount of Trona used at any given time will vary as a function of its effectiveness in controlling SO_2 emissions. The amount of Trona mill washes is a function of the number of Trona mills used for each boiler. At Waukegan Station, once the full Trona injection system is completed, there will be an estimated maximum of 18 washes per day, at 100 gallons of water per wash, for a maximum of 1800 gallons of wash water per day to be introduced into the existing wastewater treatment system. The estimated average Trona mill wash water flow is 800 gallons/day. The existing East Yard Runoff Basin Treatment System's current capacity is estimated at 3.75 MG with a Design Average Flow (DAF) of .521 MGD—(per most recent permit renewal data).

Inclusion of the proposed addition of a maximum of 1800 gallons per day of Trona mill wash water will constitute approximately 0.05% of the total capacity of the East Yard Runoff Basin. With an estimated maximum of 3% concentration of Trona in 0.34% of the total flow of the East Basin, the addition of this washwater is not expected to jeopardize the ability of this treatment system to continue to meet all applicable permit limitations. The final effluent will not be negatively impacted by this small additional volume of flow from the washwater system, which will largely consist of station service water, which is ultimately sourced from Lake Michigan.

Total suspended solids are not expected in the outfalls, due to the high solubility of this product. pH would be the only potential pollutant associated with the proposed activity. Any incremental amounts of Trona in the subwaste-stream would undergo settling/equalization within the East Yard runoff basin (Internal Outfall D01), which eventually discharges to Lake Michigan via Outfall 001. With the incremental volume of additional flow from the Trona mill washwater and the treatment provided within the East Yard basin, a measurable increase pH is not expected to occur at the final 001 outfall point.

Fate and Effect of Parameters Proposed for Increased Loading:

Given that negligible, if any, additional pollutant loading would occur as a result of this proposed modification, an adverse impact to the existing uses of the receiving water is not anticipated. Total suspended solids and pH limits will continue to be regulated in the renewed permit.

Estimated Impacts to Receiving Water Quality:

The expected concentration of Trona in the effluent would be non-detectable, and therefore, there will be no measureable pollutant loading to the receiving stream as the result of this requested subwastestream addition, and therefore no impact on existing uses and water quality of the receiving stream.

Planned Actions to Minimize Potential Loading Increases and Further Minimize Any Environmental Impacts:

The facility would take precautionary steps to minimize the amount of Trona that would be washed down. The dry sorbent injection equipment would be maintained to minimize the loss of Trona through the pump seals and joints. Any large accidental spills of Trona in the handling area would be collected and fed into the boiler rather than washed down. Only small amounts of Trona dust that accumulate on the mills would be washed down, in order to maintain mill efficiency. The floor area proximate to the mills would also be washed down, as necessary, to eliminate slipping hazards. Given the small amount of Trona that would be contained in the small volumes of washwater sent to the East Yard and Ash Treatment Systems, this modification presents the most practical course of action. The small discharge would have a negligible impact on the water quality of Outfall 001 effluent and should have no adverse impact on the existing uses of the receiving water.

Purpose and Social & Economic Benefits of the Proposed Activity:

The Trona mill wash water is a byproduct of the advanced air control measures that Waukegan Station will employ to reduce emissions of sulfur dioxide and acid gases. The proposed activity would benefit the environment by minimizing the loading of these pollutants to the atmosphere, and subsequently minimizing the atmospheric deposition of these pollutants into the Lake Michigan Basin and other regional watersheds. The large scale social and economic benefits of the installation of this air emission control technology far out-weigh the negligible impact on wastewater quality and quantity of the proposed addition of mill washwater to Internal Outfall D02 and eventual discharge through Outfall 001.

Alternatives Assessment:

The alternatives analysis for the requested modification is described below.

Collection and Repositioning of Trona Mill Washwater On-Site:

The technical and practical feasibility of collecting all of the water generated by the required mill washes is extremely limited. Even if this water were able to be adequately segregated and collected in frac tanks or similar conveyances, it would require a considerable amount of continuous effort and expense, and is therefore not a viable long-term solution. One contingency plan initially considered by MWG was to apply the Trona mill washwater around the reclaim areas of the coal pile since the reclaim area, which is a process input point leading directly to the boilers where the coal will be combusted. In other words, while the primary path would have the Trona blown into the ductwork, the Trona wash water, with minor Trona residuals, would be applied to the coal directly prior to combustion. By applying the Trona wash water around the reclaim area of the coal pile, the potential for Trona to enter the coal pile runoff would be significantly reduced. Given the insignificant quantity of un-reacted Trona which would be in the washwater, this option was not expected to have any significant or measureable impact on any regulated discharges at the station. It is unclear, however, as to whether this option would be acceptable to Illinois EPA. However, it is the only practical short-term solution for handling of the Trona washwater pending approval of the current requested permit modification.

Collection and Off-Site Handling of All Trona Mill Washwater:

This option is completely infeasible for the way that the planned FGD system will be required to operate. There will be multiple daily mill washes required when the system is in operation (as detailed in the sections above), which would require associated temporary piping/plumbing to pump the collected washwater into an endless caravan of frac tanks, which would need to be sent off-site as a waste (even though technically, it would only consist of un-reacted Trona and service water). This would be an extraordinarily expensive and laborious option, and would not result in any net benefit to the environment. In reality, the additional truck traffic and treatment of this "non-waste" would actually contribute to overall environmental detriment (through excess truck exhausts, fuel and power usage).

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GENERATION EME, LLC
An EDISON INTERNATIONAL® Company

Julia P. Wozniak
Environmental Program Manager

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September 30, 2013

Mr. Darin LeCrone
Permit Section - Division of Water Pollution Control
Illinois Environmental Protection Agency
1021 North Grand Avenue East
Springfield, Illinois 62702

Subject: Permit Modification Request for Midwest Generation
Waukegan Generating Station—NPDES Permit No. IL0002259

Dear Mr. LeCrone:

Midwest Generation (MWG) is hereby requesting a minor modification to Waukegan's new (yet-to-be-issued) NPDES permit to include the minor subwastestream that will be generated once the station's dry sorbent injection flue gas desulfurization (FGD) system is installed. The work on this project has already been initiated, as part of our commitment under the Combined Pollutant Standard (CPS) for Illinois coal-fired generating stations. (Ref: IEPA Construction Permit Numbers: 10090034 (Unit 7) and soon to be filed construction permit for Unit 8. Further details regarding this request are provided below.

Trona (Na2CO3•NaHCO3•2H2O) is a sodium-based naturally occurring mineral that reacts to remove Sulfur Dioxide (SO2) through an endothermic decomposition process (calcination), followed by an exothermic sulfation process as demonstrated in equations 1 and 2.

(Equation 1) $2(Na_2CO_3 \bullet NaHCO_3 \bullet 2H_2O) \rightarrow 3Na_2CO_3 + CO_2 + 5H_2O$

(Equation 2) $Na_2CO_3 + SO_2 + 1/2O_2 \rightarrow Na_2SO_4 + CO_2$

MSDS information on Trona is included in this submittal as **Attachment 1**.

A small amount of wastewater will be generated as part of this air emission control process. Trona will be delivered to the station and transferred to storage silos. The Trona will be metered to a pneumatic conveying system that will blow sorbent through a mill and then into the flue gas ductwork using injection lances. In order to ensure the efficiency of the milling process, the Trona mills will have to go through daily wash cycles of approximately 100 gallons of water, per wash, with a maximum estimated Trona concentration in the wash water of about 3%. (Note that this would consist of dissociated product and service water only, without any sulfate content, since the Trona is not injected into the flue gas ductwork until after it is milled).

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Suite A
Bolingbrook, Il 60440
Tel: 630 771 7880
Fax: 312 788 5274
jwozniak@mwgen.com

Trona is a naturally occurring, non-hazardous substance, and is, in fact, commonly used in a variety of household products, including toothpaste and medicine, as well as industrial water treatment processes. Based on MWG's intended use, as described in this letter, it has been determined that the incremental amount of Trona, which would be picked up in the mill wash water (sourced from the existing station service water system), would not have any significant or measureable impact on the final discharge from the station's existing wastewater treatment system or the quality of the receiving stream.

It is important to note that all of MWG's fly ash handling systems are dry, and all the residuals are trucked off-site for disposal, so there are no other expected impacts to any NPDES-permitted wastestreams as the result of the installation of this dry sorbent FGD system, other than the de minimis contribution of intermittent flow from the roof and floor drains of the Trona system building containment system, to be built on the east side of the former Units 1-5 boiler building. (See general site layout in **Attachment 2**). All intermittent drainage from the Trona system containment will be routed to the East Yard Runoff Basin (sub waste stream D01, tributary to Outfall 001) through existing station drainage systems which currently collect floor and roof drainage (as indicated in attached general station flow diagram—Attachment 3). This is not expected to add significantly to the already small, intermittent wastestream quantity or quality.

Midwest Generation (MWG) is requesting the addition of a subwaste stream to the station's existing East Yard Runoff Basin System (Outfall D01) in order to incorporate the Trona mill wash water, as well as inclusion of minor intermittent roof and floor drain flow from the Trona building containment. These requested changes will be needed once the Trona (dry sorbent injection) system is completed and operational at Waukegan Station, expected **on or before December 31, 2014.**

[Note that Trona systems are also planned to be installed at all of MWG's other generating stations within the next four years, so similar requests for the inclusion of wash water / floor and roof drains into each station's existing wastewater system will be submitted in separate request letters as these projects are initiated at the remaining MWG stations. A similar request was already sent to the Agency for Powerton Station in February, 2013—still pending final determination].

The amount of Trona used per site varies as a function of the size of each unit. The amount of Trona mill washes is a function of the number of Trona mills used for each boiler. At Waukegan Station, once the full Trona injection system is completed, there will be an estimated maximum of 18 washes per day, at 100 gallons of water per wash, for a maximum of 1800 gallons of wash water per day to be introduced into the existing wastewater treatment system. The estimated average Trona mill wash water flow is 800 gallons/day. The existing East Yard Runoff Basin Ash Treatment System's current capacity is estimated at 3.75 MG with a Design Average Flow (DAF) of .521 MGD—(per most recent permit renewal data).

Inclusion of the proposed addition of a maximum of 1800 gallons per day of Trona mill wash water will constitute approximately 0.05% the typical capacity of the East Yard Runoff Basin. With an estimated maximum of 3% concentration of Trona in 0.05% of the total volume of the East Basin, the addition of

this washwater is not expected to jeopardize the ability of this treatment system to continue to meet all applicable permit limitations. The final effluent will not be negatively impacted by this small additional volume of flow from the washwater system, which will largely consist of station service water.

The expected concentration of Trona in the final effluent from the East Yard Runoff Basin discharge would be non-detectable, and therefore, there will be no measureable pollutant loading to the receiving stream though Outfall 001 as the result of this requested subwastestream addition. Therefore, based on the information provided above, MWG does not believe that an Antidegradation assessment is required, per 35 IAC 302.105(d) (7).

Upon notification of approval by the Agency, the Trona mill washwater will be hard-piped to the existing Waukegan Outfall D01 (East Yard Runoff Basin System) in accordance with the attached outfall-specific flow diagram (See **Attachment 3**).

Since Waukegan Station's new NPDES permit has not yet been issued, MWG understands that the current (expired) permit cannot be modified. However, upon review of this request, if the Agency determines that the addition of the Trona washwater would not have any significant effect on the final discharge from Outfall D01 and/or Outfall 001, then we request that the new subwastestreams from the Trona system (wash water and Trona containment system roof and floor drains) be identified and included in the new permit, upon issuance.

In any case, we would greatly appreciate an expedited review of this request by the Agency, due to the necessity to have the Trona system installed on schedule in order to meet Air permitting compliance commitments. Please contact me if you have any questions or need any additional information in order to process this request.

Sincerely,

Julia P. Wozniak
Environmental Program Manager

Attachments:

- #1--MSDS Information
- #2--Site Layout
- #3--Updated NPDES Flow Diagrams

cc: Jaime Rabins---Illinois EPA

ATTACHMENT 1—TRONA MSDS INFORMATION

SAFETY DATA SHEET
North American Version

TRONA, NATURAL, T-50, T-200

1. PRODUCT AND COMPANY IDENTIFICATION

1.1. Identification of the substance or mixture

Product name : TRONA, NATURAL, T-50, T-200
Product grade(s) : Natural Trona
T-50
T-200

1.2. Use of the Substance/Mixture

Recommended use :
- Chemical industry
- Food/feedstuff additives
- pH-regulating agent
- Purifying flue gas

1.3. Company/Undertaking Identification

Address : SOLVAY CHEMICALS, INC.
3333 RICHMOND AVENUE
HOUSTON TX 77098-3099
United States

1.4. Emergency and contact telephone numbers

Emergency telephone number : **1 (800) 424-9300 CHEMTREC ® (USA & Canada)**
01-800-00-214-00 (MEX. REPUBLIC)

Contact telephone number (product information): : **US: +1-800-765-8292 (Product information)**
US: +1-713-525-6500 (Product information)

2. HAZARDS IDENTIFICATION

2.1. Emergency Overview:

NFPA : H= 1 F= 0 I= 0 S= None
HMIS : H= 1 F= 0 R= 0 PPE = Supplied by User; dependent on local conditions

General Information

Appearance : Fine powder
Colour : Off-white to tan
Odour : odourless, Musty odor

Main effects
- Main symptoms
- irritant effects

2.2. Potential Health Effects:

Inhalation

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- May cause nose, throat, and lung irritation.
- Repeated or prolonged exposure: Risk of sore throat, nose bleeds.

Eye contact
- Severe eye irritation
- Lachrymation
- Redness

Skin contact
- Prolonged skin contact may cause skin irritation.

Ingestion
- Irritation of the mouth and throat.
- Ingestion may cause gastrointestinal irritation, nausea, vomiting and diarrhoea.

Other toxicity effects
- See section 11: Toxicological Information

2.3. Environmental Effects:
- See section 12: Ecological Information

3. COMPOSITION/INFORMATION ON INGREDIENTS

Trisodium hydrogendicarbonate

CAS-No.	:	533-96-0
Concentration	:	**>= 90.0 - <= 98.0 %**

Silica, Crystalline Quartz

CAS-No.	:	14808-60-7
Concentration	:	**<= 2.0 %**

Undefined and non-classified component

Concentration	:	**>= 2.0 - <= 10.0 %**

4. FIRST AID MEASURES

4.1. Inhalation
- Move to fresh air.
- If symptoms persist, call a physician.

4.2. Eye contact
- If eye irritation persists, consult a specialist.
- In case of eye contact, remove contact lens and rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes.

4.3. Skin contact
- Wash off with soap and water.
- If symptoms persist, call a physician.
- Remove and wash contaminated clothing before re-use.

4.4. Ingestion
- If symptoms persist, call a physician or Poison Control Centre immediately.

If victim is conscious:
- Do NOT induce vomiting.
- Rinse mouth with water.

If victim is unconscious but breathing:
- not applicable

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5. FIREFIGHTING MEASURES

5.1. Suitable extinguishing media

- Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.

5.2. Extinguishing media which shall not be used for safety reasons

- None.

5.3. Special exposure hazards in a fire

- Not combustible.

5.4. Hazardous decomposition products

- none

5.5. Special protective equipment for firefighters

- No special precautions required.

6. ACCIDENTAL RELEASE MEASURES

6.1. Personal precautions, protective equipment and emergency procedures

6.1.1. Advice for non-emergency personnel

- Avoid dust formation.

6.1.2. Advice for emergency responders

- Sweep up to prevent slipping hazard.

6.2. Environmental precautions

- Prevent any mixture with an acid into the sewer/drain (gas formations).
- Do not flush into surface water or sanitary sewer system.

6.3. Methods and materials for containment and cleaning up

- Sweep up and shovel into suitable containers for disposal.
- Keep in properly labelled containers.
- Keep in suitable, closed containers for disposal.

7. HANDLING AND STORAGE

7.1. Handling

- Ensure adequate ventilation.

7.2. Storage

- Keep in a dry place.
- Store in original container.
- Keep in properly labelled containers.
- Keep container closed.
- Keep away from incompatible products

7.3. Packaging material

- Paper + PE coating.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1. Exposure Limit Values

Trisodium hydrogendicarbonate

- SAEL (Solvay Acceptable Exposure Limit) 2007
  TWA = 10 mg/m3

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Silica, Crystalline Quartz

- US. ACGIH Threshold Limit Values 2009
  time weighted average = 0.025 mg/m3
  Remarks: respirable dust fraction
- US. OSHA Table Z-1-A (29 CFR 1910.1000) 1989
  time weighted average = 0.1 mg/m3
  Remarks: Respirable dust
- US. Tennessee. OELs. Occupational Exposure Limits, Table Z1A 06 2008
  time weighted average = 0.1 mg/m3
  Remarks: Respirable dust
- US. OSHA Table Z-3 (29 CFR 1910.1000) 2000
  time weighted average = 2.4 millions of particles per cubic foot of air
  Remarks: Respirable., The exposure limit is calculated from the equation, 250/(%SiO2+5), using a value of 100% SiO2. Lower percentages of SiO2 will yield higher exposure limits.
- US. OSHA Table Z-3 (29 CFR 1910.1000) 2000
  time weighted average = 0.1 mg/m3
  Remarks: Respirable., The exposure limit is calculated from the equation, 10/(%SiO2+2), using a value of 100% SiO2. Lower percentages of SiO2 will yield higher exposure limits.
- US. OSHA Table Z-3 (29 CFR 1910.1000) 2000
  time weighted average = 0.3 mg/m3
  Remarks: Total dust, The exposure limit is calculated from the equation, 30/(%SiO2+2), using a value of 100% SiO2. Lower values of % SiO2 will give higher exposure limits.

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SAEL = Solvay Acceptable Exposure Limit, Time Weighted Average for 8 hour workdays. No Specific TLV STEL (Short Term Exposure Level) has been set. Excursions in exposure level may exceed 3 times the TLV TWA for no more than a total of 30 minutes during a workday and under no circumstances should they exceed 5 times the TLV TWA.

8.2. Engineering controls

- Ensure adequate ventilation.
- Provide appropriate exhaust ventilation at machinery.

8.3. Personal protective equipment

8.3.1. Respiratory protection

- Effective dust mask.
- Use only respiratory protection that conforms to international/ national standards.
- Use NIOSH approved respiratory protection.

8.3.2. Hand protection

- Wear suitable gloves.

8.3.3. Eye protection

- Chemical resistant goggles must be worn.

8.3.4. Skin and body protection

- none
- Dust impervious protective suit

8.3.5. Hygiene measures

- Eye wash bottles or eye wash stations in compliance with applicable standards.
- When using do not eat or drink.
- When using do not smoke.
- Wash hands before breaks and at the end of workday.
- Handle in accordance with good industrial hygiene and safety practice.

9. PHYSICAL AND CHEMICAL PROPERTIES

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9.1. General Information

Appearance	:	Fine powder
Colour	:	Off-white to tan
Odour	:	odourless, Musty odor

9.2. Important health safety and environmental information

pH	:	9.8 *Concentration*: 2 g/l
Boiling point/boiling range	:	*Remarks*: no data available
Flash point	:	*Remarks*: Not applicable
Flammability	:	*Lower explosion limit*: *Remarks*: The product is not flammable.
Explosive properties	:	*Explosion danger*: *Remarks*: Non-explosive
Oxidizing properties	:	*Remarks*: Non oxidizer
Vapour pressure	:	*Remarks*: no data available
Relative density / Density	:	2.11
Bulk density	: :	1,000 kg/m3 69 lb/ft3
Partition coefficient: n-octanol/water	:	*Remarks*: Not applicable
Viscosity	:	*Remarks*: no data available
Vapour density	:	*Remarks*: no data available

10. STABILITY AND REACTIVITY

10.1. Stability

- Decomposes by reaction with strong acids.
- Stable under recommended storage conditions.

10.2. Conditions to avoid

- none

10.3. Materials to avoid

- Acids
- Finely divided aluminium

10.4. Hazardous decomposition products

- none

11. TOXICOLOGICAL INFORMATION

Toxicological data

Acute oral toxicity

- LD50, rat, 4,090 mg/kg (Sodium carbonate)

Acute inhalation toxicity

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- LC50, 2 h, rat (Sodium carbonate)

Skin irritation
- Mild skin irritation

Eye irritation
- Mild eye irritation

Remarks
- no data available
- Information given is based on data obtained from similar substances.
- Irritating to eyes.

12. ECOLOGICAL INFORMATION

12.1. Ecotoxicity effects

Acute toxicity
- Fishes, various species, LC50, 96 h, from 30 - 1,200 mg/l (Sodium carbonate)
- Fishes, Gambusia affinis, LC50, 96 h, 7,550 mg/l (Sodium bicarbonate)
- Crustaceans, Daphnia sp., LC50, 48 h, from 115 - 150 mg/l (Sodium carbonate)
- Crustaceans, Daphnia magna, LC50, 48 h, 2,350 mg/l (Sodium bicarbonate)

12.2. Mobility
- Air
  Remarks: not applicable
- Water
  Remarks: considerable solubility and mobility
- Soil/sediments
  Remarks: non-significant adsorption

12.3. Persistence and degradability

Abiotic degradation
- Air
  Result: not applicable
- Water, Hydrolysis
  Degradation products: carbonic acid/bicarbonate/carbonate / acid/base equilibrium as a function of pH
- Soil
  Result: hydrolysis as a function of pH

Biodegradation
- Aerobic/anaerobic
  Remarks: not applicable

12.4. Bioaccumulative potential
- Result: not applicable

12.5. Other adverse effects
- Study in progress

12.6. Remarks
- Observed effects are related to alkaline properties of the product.
- Product is not significantly hazardous for the environment.

13. DISPOSAL CONSIDERATIONS

13.1. Waste from residues / unused products
- In accordance with local and national regulations.

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- For unused and uncontaminated product, the preferred options include sending to a licensed, permitted: recycler, reclaimer.
- Or
- Dissolve in water.
- Neutralise with acid.

13.2. Packaging treatment

- To avoid treatments, as far as possible, use dedicated containers.
- If not,
- Rinse the empty containers with plenty of water and treat the effluent in the same way as waste.
- Or
- Must be incinerated in a suitable incineration plant holding a permit delivered by the competent authorities.
- The empty and clean containers are to be reused in conformity with regulations.

13.3. RCRA Hazardous Waste

- Listed RCRA Hazardous Waste (40 CFR 302) - No
- Unlisted RCRA Hazardous Waste (40 CFR 302) - No

14. TRANSPORT INFORMATION

- Not subject
- It is recommended that ERG Guide number 111 be used for all non-regulated material.

15. REGULATORY INFORMATION

15.1. Other regulations

US. EPA Emergency Planning and Community Right-To-Know Act (EPCRA) SARA Title III Section 302 Extremely Hazardous Substance (40 CFR 355, Appendix A)

- not regulated.

SARA Hazard Designation (SARA 311/312)

- Acute Health Hazard: Yes.
- Chronic Health Hazard: Yes.

US. EPA Emergency Planning and Community Right-To-Know Act (EPCRA) SARA Title III Section 313 Toxic Chemicals (40 CFR 372.65) - Supplier Notification Required

- not regulated.

US. EPA CERCLA Hazardous Substances (40 CFR 302)

- not regulated.

US. New Jersey Worker and Community Right-to-Know Act (New Jersey Statute Annotated Section 34:5A-5)

- yes.

US. Pennsylvania Worker and Community Right-to-Know Law (34 Pa. Code Chap. 301-323)

- yes.

US. California Safe Drinking Water & Toxic Enforcement Act (Proposition 65)

- WARNING! This product contains a chemical known to the State of California to cause cancer..

16. OTHER INFORMATION

Ratings :

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NFPA (National Fire Protection Association)
Health = 1 Flammability = 0 Instability = 0 Special =None

HMIS (Hazardous Material Information System)
Health = 1 Fire = 0 Reactivity = 0 PPE : Supplied by User; dependent on local conditions

Further information

- Update
  This data sheet contains changes from the previous version in section(s): 8.1
- Distribute new edition to clients

Material Safety Data Sheets contain country specific regulatory information; therefore, the MSDS's provided are for use only by customers of the company mentioned in section 1 in North America. If you are located in a country other than Canada, Mexico or the United States, please contact the Solvay Group company in your country for MSDS information applicable to your location.

The previous information is based upon our current knowledge and experience of our product and is not exhaustive. It applies to the product as defined by the specifications. In case of combinations or mixtures, one must confirm that no new hazards are likely to exist. In any case, the user is not exempt from observing all legal, administrative and regulatory procedures relating to the product, personal hygiene, and integrity of the work environment. (Unless noted to the contrary, the technical information applies only to pure product).

To our actual knowledge, the information contained herein is accurate as of the date of this document. However, neither the company mentioned in section 1 nor any of its affiliates makes any warranty, express or implied, including merchantability or fitness for use, or accepts any liability in connection with this information or its use. This information is for use by technically skilled persons at their own discretion and risk and does not relate to the use of this product in combination with any other substance or any other process. This is not a license under any patent or other proprietary right. The user alone must finally determine suitability of any information or material for any contemplated use in compliance with applicable law, the manner of use and whether any patents are infringed. This information gives typical properties only and is not to be used for specification purposes. The company mentioned in section 1 reserves the right to make additions, deletions or modifications to the information at any time without prior notification.

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Material Safety Data Sheet

EnProve™ TR

MSDS #: 533-96-0-4
Revision Date: 2010-09-29
Version 1

This MSDS has been prepared to meet U.S. OSHA Hazard Communication Standard 29 CFR 1910.1200 and Canada's Workplace Hazardous Materials Information System (WHMIS) requirements.

1. PRODUCT AND COMPANY IDENTIFICATION

Product name	**EnProve™ TR**
Chemical Name	Sodium Sesquicarbonate
Synonyms	Milled trona; Trisodium Hydrogendicarbonate, Sesqui
Recommended use	Combustion gas treatment, For Environmental Use Only.

Manufacturer

Natronx Technologies LLC
469 North Harrison Street
Princeton, NJ 08543-5297
Phone: 609 / 683 5900 (General Information)

Emergency telephone number

+1 307 / 872 2452 (Plant - Green River, WY)
For leak, fire, spill, or accident emergencies, call:
+1 800 / 424-9300 (CHEMTREC - U.S.A. & Canada)
+1 303 / 595 9048 (Medical - Call Collect)

2. Hazards identification

Emergency Overview

Off white to yellow-brown, fine powder
Reacts with acids to release carbon dioxide and heat
Prolonged, repeated exposure to respirable silica can cause silicosis or possibly cancer

Potential health effects

Acute Toxicity

Eyes	May cause irritation.
Skin	Prolonged or repeated contact may dry skin and cause irritation.
Inhalation	May cause irritation of respiratory tract.

Chronic Toxicity

Chronic exposure to silica dust may increase the risk of developing pneumoconiosis or silicosis, chronic diseases affecting the lungs, characterized by labored breathing, cough, reduction of work capacity, reduction of lung capacity, heart enlargement and failure.

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3. Composition/information on ingredients

Ingredients

Chemical Name	CAS-No	Weight %
Sodium Sesquicarbonate	533-96-0	90-98
crystalline silica, quartz	14808-60-7	<2

4. First aid measures

Eye contact Rinse thoroughly with plenty of water, also under the eyelids. Get medical attention if irritation develops and persists.

Skin contact Wash skin with soap and water. Get medical attention if irritation develops and persists.

Inhalation Remove person to fresh air. If signs/symptoms continue, get medical attention.

Ingestion Rinse mouth with water and afterwards drink plenty of water or milk. Get medical attention if symptoms occur.

5. Fire-fighting measures

Flammable properties Noncombustible.

Flash Point Not combustible

Suitable extinguishing media Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.

Hazardous combustion products Fumes of sodium oxide.

Explosion Data

Sensitivity to Mechanical Impact Not sensitive.
Sensitivity to Static Discharge Not sensitive.

Specific hazards arising from the chemical None in particular.

NFPA	Health Hazard 1	Flammability 0	Stability 0	Special Hazards -

NFPA/HMIS Ratings Legend Severe = 4; Serious = 3; Moderate = 2; Slight = 1; Minimal = 0

6. Accidental release measures

Personal precautions Avoid breathing dust. For personal protection see section 8.

Methods for containment Vacuum or shovel waste into a drum and label contents for disposal. Prevent large quantities of this product from contacting vegetation or waterways.

Methods for cleaning up If material is not soiled or contaminated, it can be re-used indefinitely. Sweep or vacuum up spillage and return to container. Dispose of waste as indicated in Section 13.

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7. Handling and storage

Handling Keep away from incompatible products (acids). Avoid dust formation. Provide appropriate exhaust ventilation at places where dust is formed. Refer to Section 8.

Storage Store in original container. Keep in a dry place. Keep in properly labeled containers. Keep container tightly closed.

8. Exposure controls/personal protection

Exposure guidelines Local nuisance dust standards apply. Ingredients with workplace control parameters.

Chemical Name	ACGIH TLV	OSHA PEL	NIOSH	Mexico
crystalline silica, quartz 14808-60-7	TWA: 0.025 mg/m³	See note	IDLH: 50 mg/m³ TWA: 0.05 mg/m³	Mexico: TWA 0.1 mg/m³

Chemical Name	British Columbia	Quebec	Ontario TWAEV	Alberta
crystalline silica, quartz 14808-60-7	TWA: 0.025 mg/m³	TWA: 0.1 mg/m³	TWA: 0.10 mg/m³	TWA: 0.025 mg/m³

Note: OSHA PEL = 10 mg/m³/ %Si + 2, where the %Si is the concentration (in percent) of respirable crystalline silica in the sample collected, not the bulk material.

Occupational exposure controls

Engineering measures Where reasonably practicable this should be achieved by the use of local exhaust ventilation and good general extraction.

Personal Protective Equipment

General Information If the product is used in mixtures, it is recommended that you contact the appropriate protective equipment suppliers, These recommendations apply to the product as supplied

Respiratory protection If exposure limits are exceeded or irritation is experienced, NIOSH/MSHA approved respiratory protection should be worn. Positive-pressure supplied air respirators may be required for high airborne contaminant concentrations. Respiratory protection must be provided in accordance with current local regulations

Eye/face protection Safety glasses with side-shields

Skin and body protection Wear suitable protective clothing, Protective shoes or boots

Hand protection Protective gloves

Hygiene measures Handle in accordance with good industrial hygiene and safety practice. Do not eat, drink or smoke when using this product. Wash hands before breaks and at the end of workday.

9. Physical and chemical properties

Appearance Off white to yellow-brown, fine powder
Color White to yellowish brown
Physical state solid
Odor Odorless to slight, sour, pungent odor
Odor Threshold not applicable
pH 9.9 (1% solution)
Melting Point/Range Decomposes upon heating
Freezing point No information available

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Boiling Point/Range	not applicable
Flash Point	Not combustible
Evaporation rate	not applicable
Autoignition Temperature	Not combustible
Flammable properties	Noncombustible
Vapor pressure	No information available
Vapor density	No information available
Density	1.11 g/cm³
Specific Gravity	2.12
Bulk density	0.74 g/cm³
Water solubility	17.1 % @ 25 °C (as Sesqui)
Percent volatile	No information available
Partition coefficient:	not applicable
Viscosity	No information available °C
Oxidizing properties	Non-oxidizing

10. Stability and reactivity

Stability	Stable
Conditions to avoid	Avoid contact with acids
Materials to avoid	Acids
Hazardous decomposition products	Carbon dioxide (CO_2).
Hazardous polymerization	Hazardous polymerization does not occur
Hazardous reactions	None under normal processing.

11. Toxicological information

Acute effects

Eye irritation	Irritant (rabbit) (Similar product)
Skin irritation	Non-irritating (rabbit) (Similar product)
LD50 Oral	> 2000 mg/kg (rat) (Similar product)
LD50 Dermal	No information available
LC50 Inhalation:	> 5.03 mg/L 4 hr (rat) (Similar product)
Sensitization	Non-sensitizing, guinea pig. (Similar product).

Chronic Toxicity

Chronic Toxicity Chronic exposure to silica dust may increase the risk of developing pneumoconiosis or silicosis, chronic diseases affecting the lungs, characterized by labored breathing, cough, reduction of work capacity, reduction of lung capacity, heart enlargement and failure.

Carcinogenicity The table below indicates whether each agency has listed any ingredient as a carcinogen.

Chemical Name	ACGIH	IARC	NTP	OSHA
crystalline silica, quartz	A2	1	Known	X

12. Ecological information

Ecotoxicity
Not expected to have significant environmental effects

Persistence and degradability	Biodegradability does not pertain to inorganic substances. .
Bioaccumulation	Does not bioaccumulate.
Mobility	Dissociates into ions.

13. Disposal considerations

Waste disposal methods	This material, as supplied, is not a hazardous waste according to Federal regulations (40 CFR 261). This material could become a hazardous waste if it is mixed with or otherwise comes in contact with a hazardous waste, if chemical additions are made to this material, or if the material is processed or otherwise altered. Consult 40 CFR 261 to determine whether the altered material is a hazardous waste. Consult the appropriate state, regional, or local regulations for additional requirements
Contaminated packaging	Dispose of in accordance with local regulations

14. Transport information

DOT	not regulated
TDG	not regulated
ICAO/IATA	not regulated
IMDG/IMO	not regulated

15. Regulatory information

International Inventories

TSCA Inventory (United States of America)	Complies
DSL (Canada)	Complies
NDSL (Canada)	Complies
EINECS/ELINCS (Europe)	Complies
ENCS (Japan)	Complies
IECSC (China)	Complies
KECL (Korea)	Complies
PICCS (Philippines)	Complies
AICS (Australia)	Complies
NZIoC (New Zealand)	Complies

U.S. Federal Regulations
SARA 313
Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 (SARA). This product does not contain any chemicals which are subject to the reporting requirements of the Act and Title 40 of the Code of Federal Regulations, Part 372.

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SARA 311/312 Hazard Categories

Acute Health Hazard	no
Chronic Health Hazard	yes
Fire Hazard	no
Sudden Release of Pressure Hazard	no
Reactive Hazard	no

CERCLA
This material, as supplied, does not contain any substances regulated as hazardous substances under the Comprehensive Environmental Response Compensation and Liability Act (CERCLA) (40 CFR 302) or the Superfund Amendments and Reauthorization Act (SARA) (40 CFR 355). There may be specific reporting requirements at the local, regional, or state level pertaining to releases of this material.

International Regulations

Mexico - Grade No information available

Chemical Name	Carcinogen Status	Mexico
crystalline silica, quartz		Mexico: TWA 0.1 mg/m³

Canada
This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations (CPR) and the MSDS contains all the information required by the CPR.
WHMIS Hazard Class
D1A Very toxic materials

16. Other information

HMIS	Health Hazard 1	Flammability 0	Stability 0	Special precautions -

NFPA/HMIS Ratings Legend Severe = 4; Serious = 3; Moderate = 2; Slight = 1; Minimal = 0

Revision Date: 2010-09-29
Reason for revision: No information available.

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Prepared By

Product Stewardship

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End of Material Safety Data Sheet

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ATTACHMENT 2—GENERAL SITE LAYOUT

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ATTACHMENT 3—REVISED FLOW DIAGRAMS

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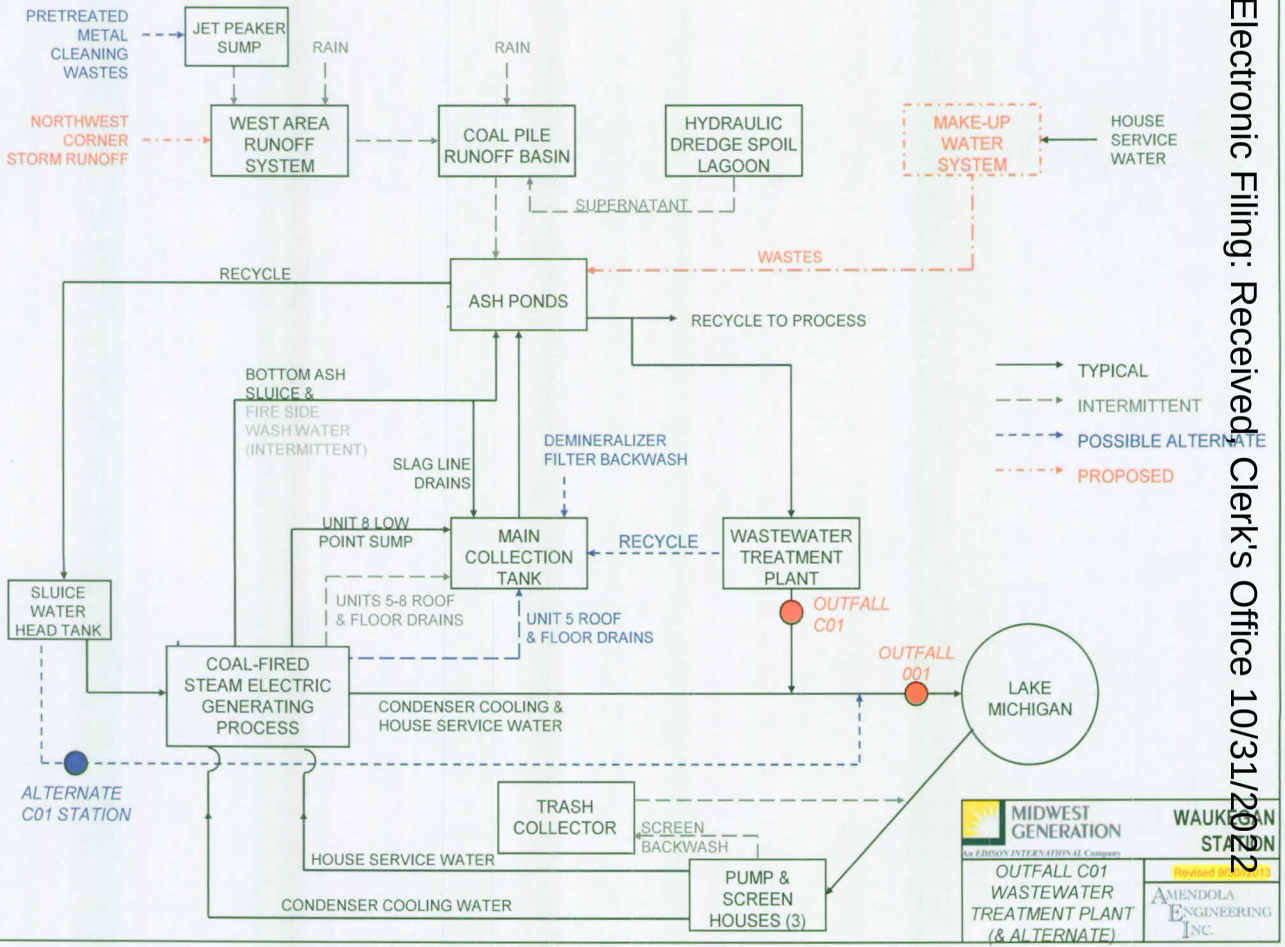
OUTFALL C01

NOTE: OTHER INTERNAL OUTFALLS NOT SHOWN



MIDWEST GENERATION
An EDISON INTERNATIONAL Company

WAUKEGAN STATION

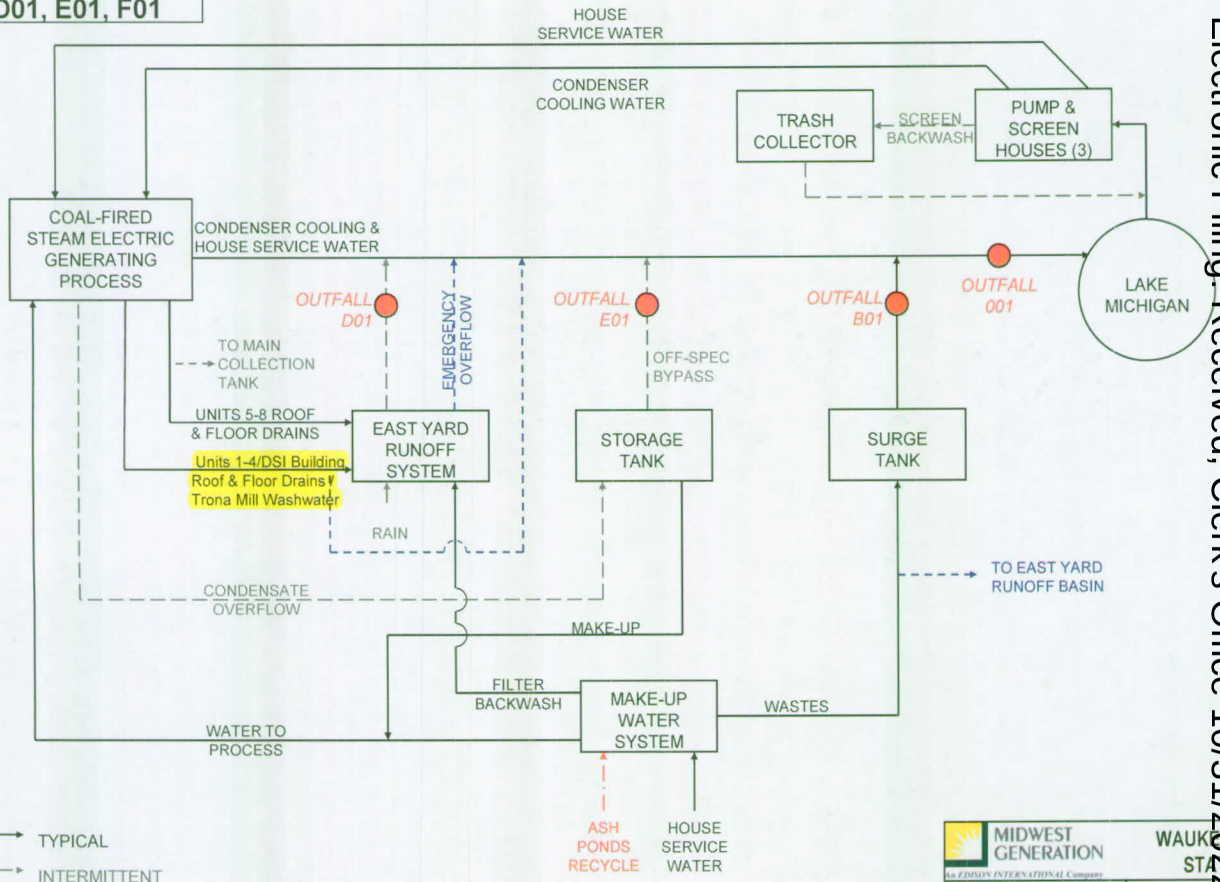
OUTFALL C01 WASTEWATER TREATMENT PLANT (& ALTERNATE)

Revised [illegible] 2013

AMENDOLA ENGINEERING INC.

OUTFALLS B01, D01, E01, F01

NOTE: OTHER INTERNAL OUTFALLS NOT SHOWN



B01 – DEMINERALIZER REGENERANT WASTES
D01 – EAST YARD RUNOFF BASIN DISCHARGE
E01 – CONDENSATE STORAGE TANK OFF-SPEC BYPASS

MIDWEST GENERATION
An EDISON INTERNATIONAL Company

WAUKEGAN STATION

OUTFALLS B01, D01, E01, F01

Revised 8/2/2013

AMENDOLA ENGINEERING INC.

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ILLINOIS ENVIRONMENTAL PROTECTION AGENCY

1021 NORTH GRAND AVENUE EAST, P.O. BOX 19276, SPRINGFIELD, ILLINOIS 62794-9276 • (217) 782-3397
BRUCE RAUNER, GOVERNOR ALEC MESSINA, ACTING DIRECTOR

217/782-0610

July 6, 2016

U. S. Environmental Protection Agency
Attention: 5WN - 16J Kevin Pierard, Chief
NPDES Programs Branch
Region V
77 West Jackson Boulevard
Chicago, Illinois 60604

Re: Midwest Generation, LLC
Waukegan Generating Station
NPDES Permit No. IL0002259
NPDES Permit Modification Request

Dear Mr. Pierard:

Please find a copy of an NPDES permit modification request for the facility referenced above.

A copy of the draft permit will be forwarded to your office for your records.

Should you have any questions or comments regarding the above, please contact me at 217/782-0610.

Sincerely,

Jaime Rabins

Jaime Rabins
Environmental Protection Engineer
Industrial Unit, Permit Section
Division of Water Pollution Control

JAR:16070601

Attachments: Modification Request Letter

cc: Records Unit

4302 N. Main St., Rockford, IL 61103 (815)987-7760
595 S. State, Elgin, IL 60123 (847)608-3131
2125 S. First St., Champaign, IL 61820 (217)278-5800
2009 Mall St., Collinsville, IL 62234 (618)346-5120
9511 Harrison St., Des Plaines, IL 60016 (847)294-4000
412 SW Washington St., Suite D, Peoria, IL 61602 (309)671-3022
2309 W. Main St., Suite 116, Marion, IL 62959 (618)993-7200
100 W. Randolph, Suite 10-300, Chicago, IL 60601

PLEASE PRINT ON RECYCLED PAPER

ILLINOIS ENVIRONMENTAL PROTECTION AGENCY

1021 NORTH GRAND AVENUE EAST, P.O. BOX 19276, SPRINGFIELD, ILLINOIS 62794-9276 • (217) 782-3397
BRUCE RAUNER, GOVERNOR ALEC MESSINA, ACTING DIRECTOR

217/782-0610

September 1, 2016

U. S. Environmental Protection Agency
Attention: 5WN - 16J Kevin Pierard, Chief
NPDES Programs Branch
Region V
77 West Jackson Boulevard
Chicago, Illinois 60604

Re: Midwest Generation, LLC
Waukegan Generating Station
NPDES Permit No. IL0002259
NPDES Permit Modification Request

Dear Mr. Pierard:

Please find a copy of an NPDES permit modification request dated August 31, 2016 for the facility referenced above.

A copy of the draft permit will be forwarded to your office for your records.

Should you have any questions or comments regarding the above, please contact me at 217/782-0610.

Sincerely,

Jaime Rabins

Jaime Rabins
Environmental Protection Engineer
Industrial Unit, Permit Section
Division of Water Pollution Control

JAR:16090101

Attachments: Modification Request Letter

cc: Records Unit

Electronic Filing: Received, Clerk's Office 10/31/2022

ILLINOIS ENVIRONMENTAL PROTECTION AGENCY

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BRUCE RAUNER, GOVERNOR ALEC MESSINA, ACTING DIRECTOR

217/782-0610

January 24, 2017

Midwest Generation, LLC
401 East Greenwood Ave.
Waukegan, IL 60087

Re: Waukegan Generating Station
NPDES Permit No. IL0002259
Draft Permit

Gentlemen:

Attached to this letter is a copy of the draft Permit, Public Notice/Fact Sheet for your discharge. The Agency proposes to issue the NPDES Permit for your discharge as shown in the draft Permit.

Fifteen days from the date of this letter, the Agency proposes to distribute the attached Public Notice/Fact Sheet statewide. If you have objections to the content of the Public Notice/Fact Sheet, a written statement must be received by the Agency at the indicated address, attention: NPDES PN Clerk within 10 days.

The Agency will receive comments regarding the Permit for a period of 30 days after the Public Notice is issued. If you wish to comment or object to any of the terms and conditions of the Permit, you must state the objections in writing prior to the end of the public notice. The Agency may or may not change the Permit based on comments received from you or the public.

If you should have questions or comments regarding the above, please contact Jaime Rabins at 217/782-0610.

Sincerely,

Darin E. LeCrone, P.E.
Manager, Industrial Unit
Division of Water Pollution Control

DEL:JAR:15042301

Attachments: Draft Permit, Public Notice/Fact Sheet

cc: Records Unit

Electronic Filing: Received, Clerk's Office 10/31/2022

ILLINOIS ENVIRONMENTAL PROTECTION AGENCY

1021 NORTH GRAND AVENUE EAST, P.O. BOX 19276, SPRINGFIELD, ILLINOIS 62794-9276 • (217) 782-3397
BRUCE RAUNER, GOVERNOR ALEC MESSINA, ACTING DIRECTOR

217/782-0610

January 24, 2017

U.S. Army Corp of Engineers
Chicago District
Attn: Regulatory Branch
231 South LaSalle Street, Suite 1500
Chicago, Illinois 60604

Re: Waukegan Generating Station
NPDES Permit No. IL0002259
Request for Corps of Engineers Comment

Attached please find a copy of the Public Notice/Fact Sheet for the subject discharge. Please review for determination of the impact of this discharge on navigation and anchorage. If no written reply is received at the indicated address, attention: NPDES PN Clerk within 15 days of the date of this request, the Agency will assume the Corps of Engineers has no objection to the proposed discharge.

Sincerely,

Darin E. LeCrone, P.E.
Manager, Industrial Unit
Division of Water Pollution Control

DEL:JAR:15042301

Attachments: Public Notice/Fact Sheet

cc: Records Unit

4302 N. Main St., Rockford, IL 61103 (815) 987-7760
9511 Harrison St., Des Plaines, IL 60016 (847) 294-4000
595 S. State, Elgin, IL 60123 (847) 608-3131
2125 S. First St., Champaign, IL 61820 (217) 278-5800
2009 Mall St., Collinsville, IL 62234 (618) 346-5120
412 SW Washington St., Suite D, Peoria, IL 61602 (309) 671-3022
2309 W. Main St., Suite 116, Marion, IL 62959 (618) 993-7200
100 W. Randolph, Suite 10-300, Chicago, IL 60601

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ILLINOIS ENVIRONMENTAL PROTECTION AGENCY

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BRUCE RAUNER, GOVERNOR ALEC MESSINA, ACTING DIRECTOR

MEMEMORANDUM

DATE: January 24, 2017

MAJOR

TO: Manager, DWPC/FOS, Des Plaines FOS

FROM: Darin E. LeCrone, Manager, Industrial Unit JEL

SUBJECT: Waukegan Generating Station
NPDES Permit No. IL0002259
Draft Permit, Public Notice/Fact Sheet

Please review the attached copy of the subject documents, and notify the Industrial Unit if you take exception to the limitations, sampling frequency, sample type or other requirements therein.

If no response is received within fifteen (15) days from the date of this memorandum, we will assume that you concur in the issuance of the Public Notice.

If you have any questions, please contact Jaime Rabins at 217/782 0610.

Thank you for your cooperation.

DEL:JAR:15042301

Attachments: Public Notice/Fact Sheet

cc: Records Unit

4302 N. Main St., Rockford, IL 61103 (815) 987-7760
9511 Harrison St., Des Plaines, IL 60016 (847) 294-4000
595 S. State, Elgin, IL 60123 (847) 608-3131
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ILLINOIS ENVIRONMENTAL PROTECTION AGENCY

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BRUCE RAUNER, GOVERNOR ALEC MESSINA, ACTING DIRECTOR

217/782-0610

January 24, 2017

MAJOR

U. S. Environmental Protection Agency
Attention: 5WN - 16J Kevin Pierard, Chief
NPDES Programs Branch
Region V
77 West Jackson Boulevard
Chicago, Illinois 60604

Re: Waukegan Generating Station
NPDES Permit No. IL0002259
Draft Permit Notification

Gentlemen:

In accordance with our agreement, we hereby submit a Draft Permit and Public Notice/Fact Sheet for the above subject discharger. The IEPA understands that this Draft Permit will not be reviewed by the Region at this time.

Should this understanding be incorrect, any verbal comments can be directed to Jaime Rabins at 217/782-0610.

Sincerely,

Darin E. LeCrone, P.E.
Manager, Industrial Unit
Division of Water Pollution Control

DEL:JAR:15042301

Attachments: Draft Permit, Public Notice/Fact Sheet, Additional Backup Material

cc: Records Unit

4302 N. Main St., Rockford, IL 61103 (815) 987-7760
9511 Harrison St., Des Plaines, IL 60016 (847) 294-4000
595 S. State, Elgin, IL 60123 (847) 608-3131
2125 S. First St., Champaign, IL 61820 (217) 278-5800
2009 Mall St., Collinsville, IL 62234 (618) 346-5120
412 SW Washington St., Suite D, Peoria, IL 61602 (309) 671-3022
2309 W. Main St., Suite 116, Marion, IL 62959 (618) 993-7200
100 W. Randolph, Suite 10-300, Chicago, IL 60601

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NPDES Permit No. IL0002259
Notice No. JAR:15042301

Public Notice Beginning Date:

Public Notice Ending Date:

DRAFT

National Pollutant Discharge Elimination System (NPDES)
Permit Program

Draft Modified NPDES Permit to Discharge into Waters of the State

Public Notice/Fact Sheet Issued By:

Illinois Environmental Protection Agency
Bureau of Water,
Division of Water Pollution Control
Permit Section
1021 North Grand Avenue East
Post Office Box 19276
Springfield, Illinois 62794-9276
217/782-0610

Name and Address of Discharger:

Midwest Generation, LLC
401 East Greenwood Ave.
Waukegan, IL 60087

Name and Address of Facility:

Midwest Generation, LLC
Waukegan Generating Station
401 East Greenwood Ave.
Waukegan, Illinois 60087
(Lake County)

The Illinois Environmental Protection Agency (IEPA) has made a tentative determination to issue a NPDES permit to discharge into the waters of the state and has prepared a draft permit and associated fact sheet for the above named discharger. The Public Notice period will begin and end on the dates indicated in the heading of this Public Notice/Fact Sheet. The last day comments will be received will be on the Public Notice period ending date unless a commentor demonstrating the need for additional time requests an extension to this comment period and the request is granted by the IEPA. Interested persons are invited to submit written comments on the draft permit to the IEPA at the above address. Commentors shall provide his or her name and address and the nature of the issues proposed to be raised and the evidence proposed to be presented with regards to those issues. Commentors may include a request for public hearing. Persons submitting comments and/or requests for public hearing shall also send a copy of such comments or requests to the permit applicant. The NPDES permit and notice number(s) must appear on each comment page.

The application, engineer's review notes including load limit calculations, Public Notice/Fact Sheet, draft permit, comments received, and other documents are available for inspection and may be copied at the IEPA between 9:30 a.m. and 3:30 p.m. Monday through Friday when scheduled by the interested person.

If written comments or requests indicate a significant degree of public interest in the draft permit, the permitting authority may, at its discretion, hold a public hearing. Public notice will be given 45 days before any public hearing. Response to comments will be provided when the final permit is issued. For further information, please call Jaime Rabins at 217/782-0610.

The applicant is engaged operation of a steam electric generating station (SIC 4911). The station operates two coal fired boilers to supply steam to two generating units, designated units 7 and 8 with a combined nominal capacity of 742 MW. The station withdraws water from Lake Michigan for condenser cooling, house service water and boiler feed water. Wastewater is generated from once-through condenser cooling, conditioning boiler feed water, backwashing the condenser cooling water intake screens, non-chemical cleaning of plant equipment, ash handling, and precipitation which contacts the site.

Plant operation results in an average discharge of 739 MGD of condenser cooling water and house service water from outfall 001, an intermittent discharge of boiler blowdown from outfall A01, 0.06 MGD of reverse osmosis wastes from outfall B01, 8.13 MGD of wastewater treatment system effluent from outfall C01, 0.676 MGD of east yard basin overflow from outfall D01, an intermittent discharge of unit 7 demineralized water storage tank drain from outfall F03, and an intermittent discharge of non-chemical metal cleaning wastes from outfall G01.

The following modifications are proposed:

1. A new discharge of 800 gpd of Trona Mill Wash from outfall D01.
2. In special condition 16 the minimum reporting limit for chloride will be changed to 1 mg/l and the minimum reporting limit for sulfate will be changed to 10 mg/l which are the minimum reporting limits the IEPA labs use for those pollutants.

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3. Removal of Ion Exchange discharges and replacement with RO discharges tributary to outfall B01. Demineralizer filter backwash outfall C01 subwastestream 6e was renamed RO filter backwash. Demineralizer filter backwash outfall D01 subwastestream 4 was renamed RO filter backwash.
4. Special Condition 6 was revised to reflect the new Electronic Reporting Rule.

Application is made for the existing discharges which is located in Lake County, Illinois. The following information identifies the discharge point, receiving stream and stream classifications:

Outfall	Receiving Stream	Latitude	Longitude	Stream Classification	Integrity Rating
001	Lake Michigan	42° 23' 00" North	87° 48' 15" West	Lake Michigan Basin	Not Rated

To assist you further in identifying the location of the discharge please see the attached map.

Lake Michigan (segment code QH-04) has a 7Q10 flow of zero cfs and is a Lake Michigan Basin water. Lake Michigan is listed on the draft 2016 Illinois Integrated Water Quality Report and Section 303(d) List as impaired for fish consumption and primary contact uses. Causes of fish consumption use impairment are given as mercury and PCBs. The cause of primary contact use impairment is given as fecal coliform bacteria. Aquatic life use is not assessed. Lake Michigan is not listed as a biologically significant stream in the 2008 Illinois Department of Natural Resources Publication *Integrating Multiple Taxa in a Biological Stream Rating System* nor is it given an integrity rating in that publication for this location. Lake Michigan is not designated as an enhanced water pursuant to the dissolved oxygen water quality standard at this location.

The discharge(s) from the facility shall be monitored and limited at all times as follows:

	LOAD LIMITS lbs/day DAF (DMF)			CONCENTRATION LIMITS mg/l		
PARAMETER	30 DAY AVERAGE	DAILY MAXIMUM	REGULATION	30 DAY AVERAGE	DAILY MAXIMUM	REGULATION
Outfall 001: Condenser Cooling Water and House Service Water (DAF = 739 MGD)						
Flow (MGD)						
pH						35 IAC 302.503
Total Residual Chlorine					0.05	40 CFR 125.3
Temperature						35 IAC 309.146
Mercury						35 IAC 309.146
Outfall A01: Boiler Blowdown (Intermittent Discharge)						
Flow (MGD)						
Total Suspended Solids				15	30	35 IAC 304.124
Oil and Grease				15	20	40CFR423.12(b)(3)
Outfall B01: Reverse Osmosis Wastes (DAF = 0.06 MGD)						
Flow (MGD)						
Total Suspended Solids				15	30	35 IAC 304.124
Oil and Grease				15	20	40CFR423.12(b)(3)
Outfall C01: Wastewater Treatment System (DAF = 8.13 MGD)						
Flow (MGD)						
Total Suspended Solids				15	30	35 IAC 304.124
Oil and Grease				15	20	40CFR423.12(b)(3)
Outfall D01: East Yard Collection Basin Overflow (DAF = 0.676 MGD)						

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PARAMETER	LOAD LIMITS lbs/day DAF (DMF) 30 DAY AVERAGE	LOAD LIMITS lbs/day DAF (DMF) DAILY MAXIMUM	REGULATION	CONCENTRATION LIMITS mg/l 30 DAY AVERAGE	CONCENTRATION LIMITS mg/l DAILY MAXIMUM	REGULATION
Flow (MGD)						
Total Suspended Solids				15	30	35 IAC 304.124
Oil and Grease				15	20	40CFR423.12(b)(3)
Outfall F01: Unit 7 Demineralized Water Storage Tank Drain(Intermittent Discharge)						
Flow (MGD)						
Total Suspended Solids				15	30	35 IAC 304.124
Oil and Grease				15	20	40CFR423.12(b)(3)
Outfall G01: Non-Chemical Metal Cleaning Wastes (Intermittent Discharge)						
Flow (MGD)						
Total Suspended Solids				30	100	40CFR423.12(b)(5)
Oil and Grease				15	20	40CFR423.12(b)(5)
Iron				1.0	1.0	40CFR423.12(b)(5)
Copper				1.0	1.0	40CFR423.12(b)(5)

The following explain the conditions of the proposed permit:

The special conditions clarify: flow reporting, pH, monitoring location, discharge monitoring reports, usage of water treatment additives, re-opening of the permit and temperature.

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Antidegradation Assessment for Trona Mill Wash Water
Waukegan Generating Station NPDES Permit No. IL0002259 Lake County

The subject facility has applied for a modification of the NPDES permit to include wastewater generated as part of an air emission control process and the roof and floor drains associated with the Trona mill building. The subject facility is installing a dry sorbent injection flue gas desulfurization system to minimize atmospheric discharges of sulfur dioxide and acid gasses. Trona ($Na_2CO_3 \bullet NaHCO_3 \bullet 2H_2O$) will be milled and blown into the flue gas ductwork using injection lances. In order to ensure the efficiency of the milling process, the Trona mills and immediately surrounding areas will have to go through daily wash cycles of approximately 100 gallons of water, per wash. This wastewater will only contain Trona, at an approximate concentration of about 3%. All of the fly ash handling system is dry; therefore any Trona that has been used to control SO_2 emissions will be disposed of offsite.

The amount of Trona used at any given time will vary as a function of its effectiveness in controlling SO_2 emissions. The amount of Trona mill washes is a function of the number of Trona mills used for each boiler. At Waukegan Station, once the full Trona injection system is completed, there will be an estimated maximum of 18 washes per day, at 100 gallons of water per wash, for a maximum of 1800 gallons of wash water per day to be introduced into the existing wastewater treatment system. The estimated average Trona mill wash water flow is 800 gallons/day.

However, total suspended solids are not expected in the effluent, due to the high solubility of this product. The wash water from the milling process will undergo setting within the East Yard Basin (Internal Outfall D01) and would then be sent to Outfall 001.

The information in this antidegradation assessment came from the September 2014 antidegradation assessment by Midwest Generation, titled Waukegan Generating Station – NPDES Permit No. IL0002259 Anti-Degradation Assessment".

Identification and Characterization of the Affected Water Body.

Lake Michigan (segment code QH-04) has a 7Q10 flow of zero cfs and is a Lake Michigan Basin water. Lake Michigan is listed on the draft 2016 Illinois Integrated Water Quality Report and Section 303(d) List as impaired for fish consumption and primary contact uses. Causes of fish consumption use impairment are given as mercury and PCBs. The cause of primary contact use impairment is given as fecal coliform bacteria. Aquatic life use is not assessed. Lake Michigan is not listed as a biologically significant stream in the 2008 Illinois Department of Natural Resources Publication *Integrating Multiple Taxa in a Biological Stream Rating System* nor is it given an integrity rating in that publication for this location. Lake Michigan is not designated as an enhanced water pursuant to the dissolved oxygen water quality standard at this location.

Identification of Proposed Pollutant Load Increases or Potential Impacts on Uses.

Existing Total Suspended Solids and pH permit limits will continue to be regulated. With the treatment provided within the East Yard Basin, a measurable increase in pH is not expected to occur at Outfall 001.

Fate and Effect of Parameters Proposed for Increased Loading.

Given that negligible, if any, additional pollutant loading would occur as a result of this proposed modification; an adverse impact to the existing uses of the receiving water is not anticipated.

The expected concentration of Trona in the effluent would be non-detectable, and therefore, there will be no measurable pollutant loading to the receiving stream as the result of the proposed wash water, and therefore no impact on existing uses and water quality of the receiving stream.

Purpose and Social & Economic Benefits of the Proposed Activity.

The Trona mill wash water is a byproduct of the advanced air control measures that Waukegan Station will employ to reduce emissions of sulfur dioxide and acid gases. This air emissions control technology installation (the basis of the requested Trona mill washwater addition) would benefit the environment by minimizing the loading of these pollutants to the atmosphere, and subsequently minimizing the atmospheric deposition of these pollutant into the Lake Michigan Basin and other regional watersheds.

Assessments of Alternatives for Less Increase in Loading or Minimal Environmental Degradation.

The facility evaluated applying the Trona washwater around the reclaim area of the coal pile. The reclaim area is where the coal process input point leading directly to the boilers where the coal will be combusted. The facility also evaluated collecting the water and sending it off-site for treatment. Neither of these alternatives was deemed feasible.

Summary Comments of the Illinois Department of Natural Resources, Regional Planning Commissions, Zoning Boards or Other Entities.

On September 9, 2014, the IDNR EcoCAT web-based tool was used and indicated that there were endangered/threatened resources (Illinois Beach INAI Site, Waukegan Beach INAI Site, Illinois Beach Nature Preserve, Bearberry (*Arctostaphylos uva-ursi*), Black-Crowned Night Heron (*Nycticorax nycticorax*), Blanding's Turtle (*Emydoidea blandingii*), Common Tern (*Sterna hirundo*), Least Bittern (*Ixobrychus exilis*), Marram Grass (*Ammophila breviligulata*), Peregrine Falcon (*Falco peregrinus*), Piping Plover (*Charadrus melodus*), Richardson's

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Rush (*Juncus alpinoarticulatus*), Sea Rocket (*Cakile edentula*), Seaside Spurge (*Chamaesyce polygonifolia*), and Upland Sandpiper (*Bartramia longicauda*))present in the vicinity of the discharge. IDNR evaluated the submittal and determined that impacts to the protected resources are unlikely. IDNR terminated the consultation request on September 11, 2014.

Agency Conclusion.

This preliminary assessment was conducted pursuant to the Illinois Pollution Control Board regulation for Antidegradation found at 35 Ill. Adm. Code 302.105 (antidegradation standard) and was based on the information available to the Agency at the time the draft permit was written. We tentatively find that the proposed activity will result in the attainment of water quality standards; that all existing uses of the receiving stream will be maintained; that all technically and economically reasonable measures to avoid or minimize the extent of the proposed increase in pollutant loading have been incorporated into the proposed activity; and that this activity will benefit the community at large by minimizing the loading of sulfur dioxide and acid gases to the atmosphere, and subsequently minimizing the atmospheric deposition of these pollutant into the Illinois River and other regional watersheds. Comments received during the NPDES permit public notice period will be evaluated before a final decision is made by the Agency.

Antidegradation Assessment for Transformation from Ion Exchange to Reverse Osmosis
Waukegan Generating Station NPDES Permit No. IL0002259 Lake County

The subject facility has applied for a permit modification to allow the transformation from ion exchange to reverse osmosis (RO) for boiler water treatment. The change involves Outfall B01, which reports to Outfall 001. The existing ion exchange demineralizer will be replaced by two RO units, one serving as a back-up. Water is withdrawn from Lake Michigan for the old and new systems. Slightly more water is required for the RO system and the discharge will increase from 0.044 MGD to 0.06 MGD. However, because the ion exchange system required the use of sulfuric acid and sodium hydroxide, discharge of sulfate and total dissolved solids will be greatly reduced by the RO system. The RO system will require hydrochloric and peracetic acid containing cleaning solutions and because of this chloride loading in the discharge will increase slightly. This review relies on information contained in a letter dated August 31, 2016 provided by the applicant.

Identification and Characterization of the Affected Water Body.

Lake Michigan (segment code QH-04) has a 7Q10 flow of zero cfs and is a Lake Michigan Basin water. Lake Michigan is listed on the draft 2016 Illinois Integrated Water Quality Report and Section 303(d) List as impaired for fish consumption and primary contact uses. Causes of fish consumption use impairment are given as mercury and PCBs. The cause of primary contact use impairment is given as fecal coliform bacteria. Aquatic life use is not assessed. Lake Michigan is not listed as a biologically significant stream in the 2008 Illinois Department of Natural Resources Publication *Integrating Multiple Taxa in a Biological Stream Rating System* nor is it given an integrity rating in that publication for this location. Lake Michigan is not designated as an enhanced water pursuant to the dissolved oxygen water quality standard at this location.

Identification of Proposed Pollutant Load Increases or Potential Impacts on Uses.

The parameter with an increase in loading is chloride. Loading of chloride will increase from 25 pounds per day currently to 30 ppd. This is because the RO system is cleaned in part using hydrochloric acid. While chloride loading rises very slightly, sulfate load decreases by 2059 ppd. Slightly more lake water will be pumped for operation of the RO system. No adverse impact on the uses of Lake Michigan is anticipated.

Fate and Effect of Parameters Proposed for Increased Loading.

The added chloride will persist in Lake Michigan. The additional amount of chloride added will be dissipated quickly and will not be measurable after mixing with cooling water prior to discharge.

Purpose and Social & Economic Benefits of the Proposed Activity.

Illinois EPA encourages companies to convert ion exchange softening to RO. The environment benefits from less dissolved substances in discharges and reduced transportation of chemicals on roads and rails. The slight increase in chloride is offset many times over by the reduction in sulfate. Conversion to RO water softening will help allow the facility to remain viable and will therefore preserve jobs.

Assessments of Alternatives for Less Increase in Loading or Minimal Environmental Degradation.

There is very little downside to the change from ion exchange to RO water softening. Alternatives to avoid the discharge of slightly increased chloride loading would be so onerous that the facility would chose to retain the existing ion exchange mode of water softening.

Summary Comments of the Illinois Department of Natural Resources, Regional Planning Commissions, Zoning Boards or Other Entities

The Illinois Department of Natural Resources was consulted regarding threatened and endangered species issues for the discharge location via the EcoCAT system on October 17, 2016. Endangered species are known from the terrestrial areas around Lake Michigan at this location. Other endangered species, a turtle and five species of birds, are dependent on water but are not likely found in the habitat near the discharge. IDNR responded to the endangered species consultation in a letter dated October 28, 2016 that terminated consultation.

Agency Conclusion.

This preliminary assessment was conducted pursuant to the Illinois Pollution Control Board regulation for Antidegradation found at 35 Ill. Adm. Code 302.105 (antidegradation standard) and was based on the information available to the Agency at the time the draft permit was written. We tentatively find that the proposed activity will result in the attainment of water quality standards; that all existing uses of the receiving waters will be maintained; that all technically and economically reasonable measures to avoid or minimize the extent of the proposed increase in pollutant loading have been incorporated into the proposed activity; and that this activity will benefit the local community by preserving jobs. Comments received during the NPDES permit public notice period will be evaluated before a final decision is made by the Agency.

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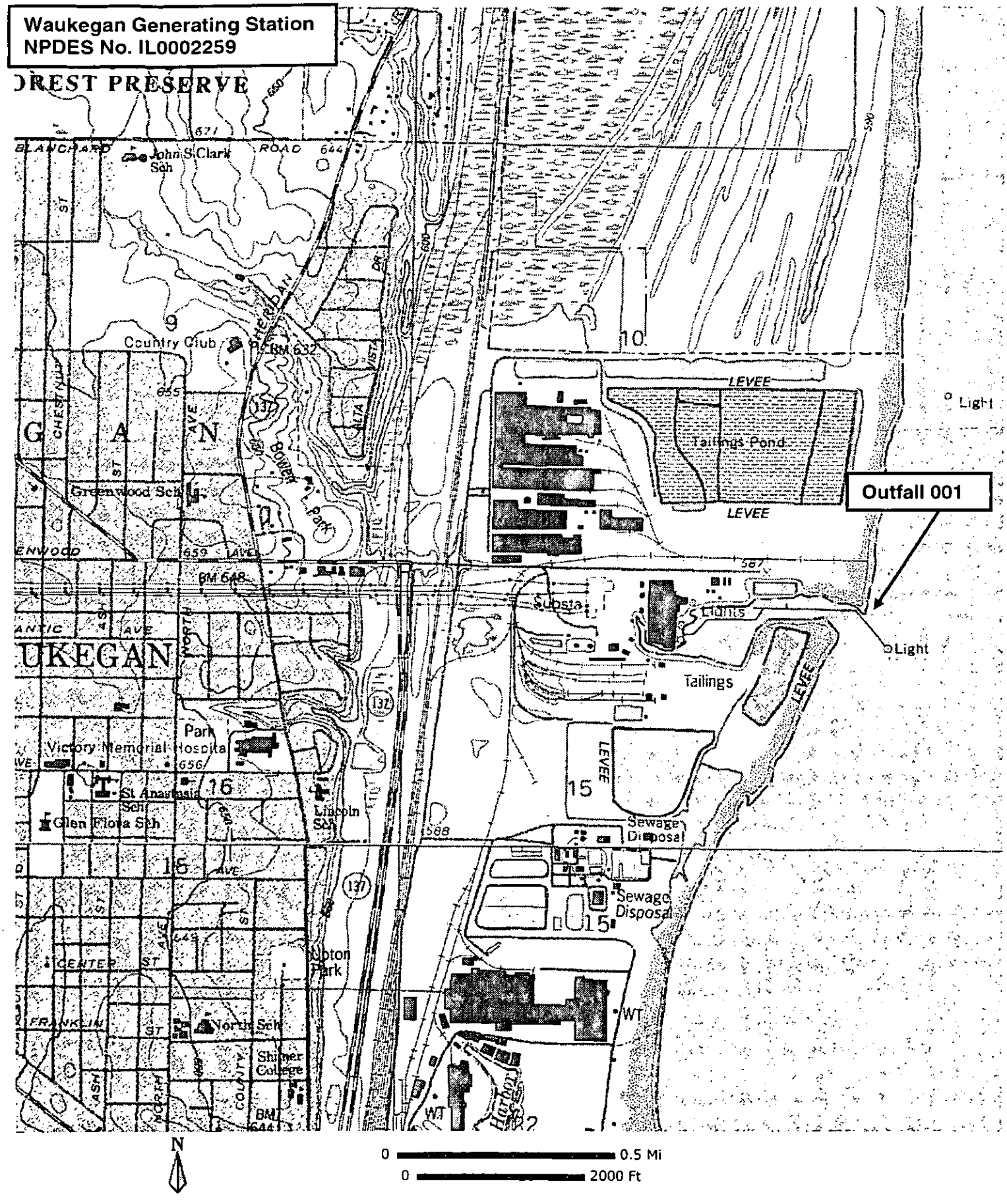
Water Treatment Additives Evaluation for Use in the RO system
Waukegan Generating Station NPDES Permit No. IL0002259 Lake County

Sodium hydroxide, hydrochloric acid, citric acid, Vitec 3000 (corrosion inhibitor): These products have been previously reviewed and approved for use at this facility. Small increases in usage resulting from operation and cleaning of the RO system would not adversely affect aquatic life in the receiving water or require revised permit limitations.

Peracetic acid: The product is a disinfectant that would be used for maintenance cleaning of the RO membranes every 2-4 days. The product would be dosed at a maximum concentration of 1,000 ppm into 600 gallons of cleaning water, with the RO membranes being soaked in the cleaning solution to maximize disinfection. The spent cleaning solution would be sent to Outfall B01 and internally dilute with Outfall 001 effluent prior to discharge. The worst case discharge concertation of the product would be 0.3 ppm, which is roughly equivalent to the acute toxicity of peracetic acid (based on information ascertained from on-going regional efforts to develop criteria for this substance). However, the actual peracetic acid concertation at Outfall 001 would be far lower, and likely non-detect, after interacting with RO membranes as well as any residual organic material in B01/001 effluent.


Waukegan Generating Station
NPDES No. IL0002259
Outfall 001
LEVEE
Tailings Pond
Tailings
Substa
Lights
Light
Sewage Disposal
Country Club
Greenwood Sch
Victory Memorial Hospital
St Anastasia Sch
Glen Flora Sch
Lincoln Sch
Upton Park
North Sch
Shimer College
John S Clark Sch
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Public Notice of Draft Permit

Public Notice Number JAR:15042301 is hereby given by Illinois EPA, Division of Water Pollution Control, Permit Section, 1021 North Grand Avenue East, Post Office Box 19276, Springfield, Illinois 62794-9276 (herein Agency) that a draft modified National Pollutant Discharge Elimination System (NPDES) Permit Number IL0002259 has been prepared under 40 CFR 124.6(d) for Midwest Generation, LLC for discharge into Lake Michigan from the Waukegan Generating Station, 401 East Greenwood Ave., Waukegan, Illinois 60087, (Lake County).

The station operates three coal fired boilers to supply steam to two generating units, designated units 7 and 8 with a combined nominal capacity of 742 MW. The station withdraws water from Lake Michigan for condenser cooling, house service water and boiler feed water. Wastewater is generated from once-through condenser cooling, conditioning boiler feed water, backwashing the condenser cooling water intake screens, non-chemical cleaning of plant equipment, ash handling, and precipitation which contacts the site.

Plant operation results in an average discharge of 739 MGD of condenser cooling water and house service water from outfall 001, an intermittent discharge of boiler blowdown from outfall A01, 0.06 MGD of reverse osmosis wastes from outfall B01, 8.13 MGD of wastewater treatment system effluent from outfall C01, 0.676 MGD of east yard basin overflow from outfall D01, an intermittent discharge of unit 7 demineralized water storage tank drain from outfall F03, and an intermittent discharge of non-chemical metal cleaning wastes from outfall G01.

The application, draft permit and other documents are available for inspection and may be copied at the Agency between 9:30 a.m. and 3:30 p.m. Monday through Friday. A Fact Sheet containing more detailed information is available at no charge. For further information, call the Public Notice Clerk at 217/782-0610.

Interested persons are invited to submit written comments on the draft permit to the Agency at the above address. The NPDES Permit and Joint Public Notice numbers must appear on each comment page. All comments received by the Agency not later than 30 days from the date of this publication shall be considered in making the final decision regarding permit issuance.

Any interested person may submit written request for a public hearing on the draft

If written comments and/or requests indicate a significant degree of public interest in the draft permit, the permitting authority may, at its discretion, hold a public hearing. Public notice will be given 30 days before any public hearing.

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NPDES Permit No. IL0002259

Illinois Environmental Protection Agency

Division of Water Pollution Control

1021 North Grand Avenue East

Post Office Box 19276

Springfield, Illinois 62794-9276

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM

Modified (NPDES) Permit

Expiration Date: March 31, 2020

Issue Date: March 25, 2015
Modification Date:

Name and Address of Permittee:

Midwest Generation, LLC
401 East Greenwood Ave.
Waukegan, IL 60087

Facility Name and Address:

Midwest Generation, LLC
Waukegan Generating Station
401 East Greenwood Ave.
Waukegan, Illinois 60087
(Lake County)

Discharge Number and Name:

001 Condenser Cooling Water and House Service Water
A01 Boiler Blowdown
B01 Reverse Osmosis Wastes
C01 Wastewater Treatment System
D01 East Yard Collection Basin Overflow
F01 Unit 7 Demineralized Water Storage Tank Drain
G01 Non-Chemical Metal Cleaning Wastes

Receiving Waters:

Lake Michigan

In compliance with the provisions of the Illinois Environmental Protection Act, Title 35 of Ill. Adm. Code, Subtitle C and/or Subtitle D, Chapter 1, and the Clean Water Act (CWA), the above-named permittee is hereby authorized to discharge at the above location to the above-named receiving stream in accordance with the standard conditions and attachments herein.

Permittee is not authorized to discharge after the above expiration date. In order to receive authorization to discharge beyond the expiration date, the permittee shall submit the proper application as required by the Illinois Environmental Protection Agency (IEPA) not later than 180 days prior to the expiration date.

Alan Keller, P.E.
Manager, Permit Section
Division of Water Pollution Control

SAK:JAR:15042301

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Modification Date:

NPDES Permit No. IL0002259

Effluent Limitations and Monitoring

From the modification date of this permit until the expiration date, the effluent of the following discharge(s) shall be monitored and limited at all times as follows:

PARAMETER	LOAD LIMITS lbs/day DAF (DMF) 30 DAY AVERAGE	LOAD LIMITS lbs/day DAF (DMF) DAILY MAXIMUM	CONCENTRATION LIMITS mg/l 30 DAY AVERAGE	CONCENTRATION LIMITS mg/l DAILY MAXIMUM	SAMPLE FREQUENCY	SAMPLE TYPE
Outfall 001: Condenser Cooling Water and House Service Water (DAF = 739 MGD)						
This discharge consists of:						
1. Condenser cooling water				589 MGD		
2. House service water				29.7 MGD		
3. Boiler blowdown				Intermittent		
4. Reverse osmosis wastes				0.06 MGD		
5. Wastewater treatment system effluent				8.13 MGD		
6. East yard runoff basin overflow/discharge				0.676 MGD		
7. Demineralized water (storage tank drainage and steam relief)				Intermittent		
8. Intake screen backwash				0.172 MGD		
Flow (MGD)	See Special Condition 1				Daily	Continuous
pH	See Special Condition 2				Weekly	Grab
Total Residual Chlorine	See Special Condition 3			0.05	*	Grab
Temperature	See Special Condition 4				Daily	Continuous
Heat Rejection Rate				5301 million BTU's per hour	Daily	Continuous

The monthly maximum temperature and the monthly maximum BTU's per hour shall be reported on the DMR under temperature and heat rejection rate, respectively.

*Total Residual Chlorine shall be sampled whenever chlorination or biocide addition is being performed or residuals are likely to be present in the discharge. If chlorination and biocide addition are not used during the month it shall be so indicated on the DMR.

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Effluent Limitations and Monitoring

From the modification date of this permit until the expiration date, the effluent of the following discharge(s) shall be monitored and limited at all times as follows:

PARAMETER	LOAD LIMITS lbs/day DAF (DMF) 30 DAY AVERAGE	LOAD LIMITS lbs/day DAF (DMF) DAILY MAXIMUM	CONCENTRATION LIMITS mg/l 30 DAY AVERAGE	CONCENTRATION LIMITS mg/l DAILY MAXIMUM	SAMPLE FREQUENCY	SAMPLE TYPE
Outfall A01: Boiler Blowdown (Intermittent Discharge)						
The discharge consists of:				Approximate Flow		
1. Boiler blowdown				0.018 MGD		
2. Boiler drains				0.018 MGD		
Flow (MGD)	See Special Condition 1				2/Month When Discharging	Calculated 24-Hour Total
Total Suspended Solids			15	30	2/Month When Discharging	8-Hour Composite
Oil and Grease			15	20	2/Month When Discharging	Grab

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Effluent Limitations and Monitoring

From the modification date of this permit until the expiration date, the effluent of the following discharge(s) shall be monitored and limited at all times as follows:

PARAMETER	LOAD LIMITS lbs/day DAF (DMF) 30 DAY AVERAGE	LOAD LIMITS lbs/day DAF (DMF) DAILY MAXIMUM	CONCENTRATION LIMITS mg/l 30 DAY AVERAGE	CONCENTRATION LIMITS mg/l DAILY MAXIMUM	SAMPLE FREQUENCY	SAMPLE TYPE
Outfall B01: Reverse Osmosis Wastes (DAF = 0.06 MGD)						
The discharge consists of:				Approximate Flow		
1. Reverse Osmosis Reject				65 gpm		
2. Reverse Osmosis Regeneration				450 gallons/cleaning		
Flow (MGD)	See Special Condition 1				2/Month	24-Hour Total
Total Suspended Solids			15	30	2/Month	8-Hour Composite
Oil and Grease			15	20	2/Month	Grab

Total Suspended Solids and Oil and Grease sampling may obtained using a Grab Sample if the equalization tank is in service.

Modification Date:

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NPDES Permit No. IL0002259

Effluent Limitations and Monitoring

From the modification date of this permit until the expiration date, the effluent of the following discharge(s) shall be monitored and limited at all times as follows:

PARAMETER	LOAD LIMITS lbs/day DAF (DMF) 30 DAY AVERAGE	LOAD LIMITS lbs/day DAF (DMF) DAILY MAXIMUM	CONCENTRATION LIMITS mg/l 30 DAY AVERAGE	CONCENTRATION LIMITS mg/l DAILY MAXIMUM	SAMPLE FREQUENCY	SAMPLE TYPE
Outfall C01: Wastewater Treatment System (DAF = 8.13 MGD)						
This Discharge consists of:				Approximate Flow		
1. Bottom Ash Sluice				1.6 MGD		
2. Ash hopper overflow				Intermittent		
3. Coal pile runoff collection basin discharge				1.0 MGD		
a. Coal pile area runoff				0.5 MGD		
b. West yard area runoff				0.5 MGD		
i. West yard area runoff						
ii. Car dumper area runoff						
iii. Main switch yard area runoff						
iv. West yard polymer building drains						
v. Peaker sump discharges						
vi. West turbine area roof drains						
4. Non-chemical metal cleaning waste				Intermittent		
5. Supernatant from dredge spoil lagoons				Intermittent		
6. Main collection tank discharge				2.0 MGD		
a. Unit 8 low point sump (roof, floor, & equipment drains)				Intermittent		
b. Ash sluice head tank overflow				Intermittent		
c. Slag drain line				Intermittent		
d. Slag tank overflows				Intermittent		
e. RO filter backwash (alternate route)				Intermittent		
f. Floor drains (alternate route)				Intermittent		
Flow (MGD)	See Special Condition 1				Daily	Continuous
Total Suspended Solids			15	30	2/Month	24-Hour Composite
Oil and Grease			15	20	2/Month	Grab

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Modification Date:

NPDES Permit No. IL0002259

Effluent Limitations and Monitoring

From the modification date of this permit until the expiration date, the effluent of the following discharge(s) shall be monitored and limited at all times as follows:

PARAMETER	LOAD LIMITS lbs/day DAF (DMF) 30 DAY AVERAGE	LOAD LIMITS lbs/day DAF (DMF) DAILY MAXIMUM	CONCENTRATION LIMITS mg/l 30 DAY AVERAGE	CONCENTRATION LIMITS mg/l DAILY MAXIMUM	SAMPLE FREQUENCY	SAMPLE TYPE
Outfall D01: East Yard Collection Basin Overflow (DAF = 0.676 MGD)						
This discharge consists of:				Approximate Flow		
1. East yard area runoff				Intermittent		
2. Units 1-4 roof and floor drainage				Intermittent		
3. East yard polymer building drains				Intermittent		
4. RO filter backwash				0.078 MGD		
5. Laboratory sink drains				Intermittent		
6. Units 5-8 roof and floor drains				Intermittent		
7. Trona Mill Wash				800 gpd		
Flow (MGD)	See Special Condition 1				1/Week	24-Hour Total
Total Suspended Solids			15	30	2/Month	24-Hour Composite
Oil and Grease			15	20	2/Month	Grab

Modification Date:

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Effluent Limitations and Monitoring

From the modification date of this permit until the expiration date, the effluent of the following discharge(s) shall be monitored and limited at all times as follows:

PARAMETER	LOAD LIMITS lbs/day DAF (DMF) 30 DAY AVERAGE	LOAD LIMITS lbs/day DAF (DMF) DAILY MAXIMUM	CONCENTRATION LIMITS mg/l 30 DAY AVERAGE	CONCENTRATION LIMITS mg/l DAILY MAXIMUM	SAMPLE FREQUENCY	SAMPLE TYPE
Outfall F01: Unit 7 Demineralized Water Storage Tank Drain(Intermittent Discharge)						
Flow (MGD)	See Special Condition 1				1/Week When Discharging	Estimate
Total Suspended Solids			15	30	1/Week When Discharging	Grab
Oil and Grease			15	20	1/Week When Discharging	Grab

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Modification Date:

NPDES Permit No. IL0002259

Effluent Limitations and Monitoring

From the modification date of this permit until the expiration date, the effluent of the following discharge(s) shall be monitored and limited at all times as follows:

PARAMETER	LOAD LIMITS lbs/day DAF (DMF) 30 DAY AVERAGE	LOAD LIMITS lbs/day DAF (DMF) DAILY MAXIMUM	CONCENTRATION LIMITS mg/l 30 DAY AVERAGE	CONCENTRATION LIMITS mg/l DAILY MAXIMUM	SAMPLE FREQUENCY	SAMPLE TYPE
Outfall G01: Non-Chemical Metal Cleaning Wastes (DAF = Intermittent Discharge)						
Flow (MGD)	See Special Condition 1				Daily When Discharging	Continuous
Total Suspended Solids			30	100	Daily When Discharging	24-Hour Composite
Oil and Grease			15	20	Daily When Discharging	Grab
Iron			1.0	1.0	Daily When Discharging	24-Hour Composite
Copper			1.0	1.0	Daily When Discharging	24-Hour Composite

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Special Conditions

SPECIAL CONDITION 1. Flow shall be measured in units of Million Gallons per Day (MGD) and reported as a monthly average and a daily maximum value on the monthly Discharge Monitoring Report.

SPECIAL CONDITION 2. The pH shall be in the range 7.0 to 9.0. The monthly minimum and monthly maximum values shall be reported on the DMR form.

The permittee shall achieve compliance with the above pH limitation at outfall 001 as soon as possible but not later than 18 months from the effective date of this permit in accordance with the following schedule:

	ITEM	COMPLETION DATE
1.	Initial Report	6 Months from the Effective Date
2.	Interim Report	12 Months from the Effective Date
3.	Final Report and Compliance	18 Months from the Effective Date

From the effective date of the permit, pH shall be monitored at outfall 001 weekly as specified on page 2 of the permit. The initial report shall include a summary of this data and a determination of whether or not additional treatment is necessary to achieve and maintain compliance with the applicable pH limit. If additional treatment is determined not to be necessary, compliance with the applicable pH limit is required 6 months from the effective date of this permit. All reports shall be submitted to the IEPA at the address in special condition 6.

SPECIAL CONDITION 3. All samples for total residual chlorine (TRC) shall be analyzed by an applicable method contained in 40 CFR 136, equivalent in accuracy to low-level amperometric titration. Any analytical variability of the method used shall be considered when determining the accuracy and precision of the results obtained.

SPECIAL CONDITION 4. Pursuant to Illinois Pollution Control Board Order 77-82, dated August 3, 1978 the discharge is limited to a heat rejection rate of 5301 million BTU's per hour in lieu of the standards of 35 Ill. Adm. Code 302.507. The Permittee's demonstration for the Waukegan Generating Station in accordance with Section 316(a) of the CWA was approved by the Illinois Pollution Control Board in Order PCB 78-72, -73 Consolidated dated September 21, 1978.

Compliance with this part shall be determined on a continuous basis by the following equation:

$$H = 0.0005 Q_{CW} (T_{CW} - T_{US})$$

H Heat Rejection Rate in million BTU's per hour.

T_{CW} Actual condenser cooling water discharge temperature in degrees Fahrenheit from continuous temperature monitor located at the condenser outlet waterbox.

Q_{CW} Condenser cooling water flow in gallons per minute based on the number of circulating water pumps on at the time in question. Each of Unit 7's four circulating water pumps is rated at 64,000 gpm and each of Unit 8's two circulating water pumps is rated at 110,000 gpm.

T_{US} Intake cooling water temperature in degrees Fahrenheit from the continuous temperature monitor located at the condenser inlet waterbox.

As a condition of the continuation of the facility's 316(a) thermal variance (PCB 72-73 Consolidated, dated September 21, 1978), the permittee shall conduct the following activities and studies:

1. Within six months of the permit issuance date:

   a. Complete a literature search for biological studies conducted in Lake Michigan in the general vicinity of the facility, including but not limited to, relevant biological monitoring data from state or federal agencies.
   b. Prepare a Representative Important Species (RIS) List, including an explanation of the rationale for selection of each species on the list; and
   c. Based on the results of the biological studies literature search and the RIS List, prepare a study plan for biological sampling and thermal monitoring, including as appropriate thermal modeling. The study plan shall be submitted to the Agency for approval prior to initiation. The study plan shall include the RIS List. The permittee shall also send a copy of the study plan and RIS List to the U.S. EPA Region 5 to provide it with an opportunity to review and comment on the study plan prior to commencement of the study.

2. Upon the Agency's approval of the study plan for biological and thermal monitoring, perform thermal plume surveys on the facility's discharge and any appropriate thermal model development and field verification within eighteen months of the receipt of the Agency's approval. In the event that the Agency's approval of the study plan is not received within nine months of the permit issuance date, the permittee may proceed to implement the study plan pending receipt of the Agency's approval.

3. Based on the information obtained from thermal plume surveys, the permittee shall finalize the specific sampling locations for,

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and conduct, the biological monitoring study plan.

If the permittee intends to request the continuation of the 316(a) thermal variance in its renewed NPDES permit, the permittee shall submit to the Agency a report containing the results of the biological and thermal monitoring, including any applicable thermal modeling, and any other information necessary to comply with 35 Ill. Adm. Code 106.1180 concurrent with its next NPDES permit renewal application.

Alternately, the Permittee may demonstrate to the Agency that alternate thermal standards of PCB 77-82, or other site specific water quality standards for temperature approved by the Illinois Pollution Control Board, and USEPA, meets the requirements of 40 CFR 131 and the Illinois Environmental Protection Act.

SPECIAL CONDITION 5. Samples taken in compliance with the effluent monitoring requirements shall be taken at a point representative of the discharge, but prior to entry into the receiving stream.

SPECIAL CONDITION 6. The Permittee shall record monitoring results on Discharge Monitoring Report (DMR) Forms using one such form for each outfall each month.

In the event that an outfall does not discharge during a monthly reporting period, the DMR Form shall be submitted with no discharge indicated.

The Permittee may choose to submit electronic DMRs (NetDMR) instead of mailing paper DMRs to the IEPA. More information, including registration information for the NetDMR program, can be obtained on the IEPA website, http://www.epa.state.il.us/water/net-dmr/index.html.

The completed Discharge Monitoring Report forms shall be submitted to IEPA no later than the 28th day of the following month, unless otherwise specified by the permitting authority.

Permittees not using NetDMR shall mail Discharge Monitoring Reports with an original signature to the IEPA at the following address:

Illinois Environmental Protection Agency
Division of Water Pollution Control
1021 North Grand Avenue East
Post Office Box 19276
Springfield, Illinois 62794-9276

Attention: Compliance Assurance Section, Mail Code # 19

SPECIAL CONDITION 7. Cooling Water Intake Structure. Based on available information, the Agency has determined that the operation of the cooling water intake structure meets the equivalent of Best Technology Available (BTA) in accordance with the Best Professional Judgment provisions of 40 CFR 125.3 and 40 CFR 125.90(b), based on information available at the time of permit reissuance.

However, the Permittee shall comply with the requirements of the Cooling Water Intake Structure Existing Facilities Rule as found at 40 CFR 122 and 125. Any application materials and submissions required for compliance with the Existing Facilities Rule, shall be submitted to the Agency no later than 4 years from the effective date of this permit.

If for any reason, the Cooling Water Intake Structure Existing Facilities Rule is stayed or remanded by the courts, the Permittee shall comply with the requirements below. The information required below is necessary to further evaluate cooling water intake structure operations based on the most up to date information, in accordance with the Best Professional Judgment provisions of 40 CFR 125.3 and 40 CFR 125.90(b), in existence prior to the effective date of the new Existing Facilities Rule:

A. The permittee shall submit the following information/studies within 4 years of the effective date of the permit:

1. Source Water Physical Data to include:

   a. A narrative description and scaled drawings showing the physical configuration of all source water bodies used by the facility including aerial dimensions, depths, salinity and temperature regimes;

   b. Identification and characterization of the source waterbody's hydrological and geomorphological features, as well as the methods used to conduct any physical studies to determine the intake's area of influence and the results of such studies; and

   c. Location maps.

2. Source Waterbody Flow Information

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The permittee shall provide the annual mean flow of the waterbody, any supporting documentation and engineering calculations to support the analysis of whether the design intake flow is greater than five percent of the mean annual flow of the river or stream for purposes of determining applicable performance standards. Representative historical data (from a period of time up to 10 years) shall be used, if available.

3. Impingement Mortality and Entrainment Characterization Study

   The permittee shall submit an Impingement Mortality and Entrainment Characterization Study whose purpose is to provide information to support the development of a calculation baseline for evaluating impingement mortality and entrainment and to characterize current impingement mortality and entrainment. The Study shall include the following in sufficient detail to support establishment of baseline conditions:

   a. Taxonomic identification of all life stages of fish and shellfish and any species protected under Federal, State, or Tribal law (including threatened or endangered species) that are in the vicinity of the cooling water intake structure(s) and are susceptible to impingement and entrainment;

   b. A characterization of all life stages of fish and shellfish, and any species protected under Federal, or State law, including a description of the abundance and temporal and spatial characteristics in the vicinity of the cooling water intake structure(s). These may include historical data that are representative of the current operation of the facility and of biological conditions at the site; and

   c. Documentation of the current impingement mortality and entrainment of all life stages of fish, shellfish, and any species protected under Federal , State, or Tribal Law (including threatened or endangered species) and an estimate of impingement mortality and entrainment to be used as the calculation baseline. The documentation may include historical data that are representative of the current operation of the facility and of biological conditions at the site. Impingement mortality and entrainment samples to support the calculations required must be collected during periods of representative operational flows for the cooling water intake structure and the flows associated with the samples must be documented.

B. The permittee shall comply with the following requirements:

   1. At all times properly operate and maintain the intake equipment as demonstrated in the application material supporting the BTA determination.

   2. Inform IEPA of any proposed changes to the cooling water intake structure or proposed changes to operations at the facility that affect impingement mortality and/or entrainment.

   3. Debris collected on intake screens is prohibited from being discharged back to the canal. Debris does not include living fish or other living aquatic organisms.

   4. Compliance Alternatives. The permittee must evaluate each of the following alternatives for establishing best available technology for minimizing adverse environmental impacts at the facility due to operation of the intake structure:

      a. Evaluate operational procedures and/or propose facility modifications to reduce the intake through-screen velocity to less than 0.5 ft/sec. The operational evaluation may consider modified circulating water pump operation; reduced flow associated with capacity utilization, recalculation or determination of actual total water withdrawal capacity. The evaluation report and any implementation plan for the operational changes and/ or facility modification shall be submitted to the Agency with the renewal application for this permit.

      b. Complete a fish impingement and entrainment mortality minimization alternatives evaluation. The evaluation may include an assessment of modification of the traveling screens, consideration of a separate fish and debris return system and include time frames and cost analysis to implement these measures. The evaluation report and implementation plan for any operational changes and/ or facility modifications shall be submitted to the Agency with the renewal application for this permit.

C. All required reports shall be submitted to the Industrial Unit, Permit Section and Compliance Assurance Section at the address in special condition 6.

This special condition does not relieve the permittee of the responsibility of complying with any other laws, regulations, or judicial orders issued pursuant to Section 316(b) of the Clean Water Act.

SPECIAL CONDITION 8. If an applicable effluent standard or limitation is promulgated under Sections 301(b)(2)(C) and (D), 304(b)(2), and 307(a)(2) of the Clean Water Act and that effluent standard or limitation is more stringent than any effluent limitation in the permit or

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controls a pollutant not limited in the NPDES Permit, the Agency shall revise or modify the permit in accordance with the more stringent standard or prohibition and shall so notify the permittee.

SPECIAL CONDITION 9. The use or operation of this facility shall be by or under the supervision of a Certified Class K operator.

SPECIAL CONDITION 10. In the event that the permittee shall require changes in the use of water treatment additives, the permittee must request a change in this permit in accordance with the Standard Conditions -- Attachment H.

SPECIAL CONDITION 11. The cooling water prior to entering the intake structure and at outfall 001 shall be sampled once per week as a grab sample at the same time of day within ½ hour of each other between 9:00 a.m. and 3:00 p.m. in a random fashion for dissolved oxygen. The results in mg/l and the time of day the influent and effluent sample was taken shall be reported to the Agency as an attachment to the DMR. After 2 years of data has been submitted to the Agency, the permittee may apply to Agency to have the monitoring reduced or eliminated.

SPECIAL CONDITION 12. There shall be no discharge of polychlorinated biphenyl compounds.

SPECIAL CONDITION 13. The bypass provisions of 40 CFR 122.41(m) and upset provisions of 40 CFR 122.41(n) are hereby incorporated by reference.

SPECIAL CONDITION 14. The Agency has determined that the effluent limitations for outfall 001 constitute BAT/BCT for storm water which is treated in the existing treatment facilities for purposes of this permit reissuance, and no pollution prevention plan will be required for such storm water. In addition to the chemical specific monitoring required elsewhere in this permit, the permittee shall conduct an annual inspection of the facility site to identify areas contributing to a storm water discharge associated with industrial activity, and determine whether any facility modifications have occurred which result in previously-treated storm water discharges no longer receiving treatment. If any such discharges are identified the permittee shall request a modification of this permit within 30 days after the inspection. Records of the annual inspection shall be retained by the permittee for the term of this permit and be made available to the Agency on request.

SPECIAL CONDITION 15. There shall be no discharge of complexed metal bearing wastestreams and associated rinses from chemical metal cleaning unless this permit has been modified to include the new discharge.

SPECIAL CONDITION 16. The Permittee shall monitor the effluent from outfall 001 for the following parameters on a semi-annual basis. This Permit may be modified with public notice to establish effluent limitations if appropriate, based on information obtained through sampling. The sample shall be a 24-hour effluent composite except as otherwise specifically provided below and the results shall be submitted to the address in special condition 6 in June and December. The parameters to be sampled and the minimum reporting limits to be attained are as follows:

STORET CODE	PARAMETER	Minimum reporting limit
01002	Arsenic	0.05 mg/L
01007	Barium	0.5 mg/L
01022	Boron	0.1 mg/L
01027	Cadmium	0.001 mg/L
00940	Chloride	1.0 mg/L
01032	Chromium (hexavalent) (grab)	0.01 mg/L
01034	Chromium (total)	0.05 mg/L
01042	Copper	0.005 mg/L
00718	Cyanide (grab) (available *** or amendable to chlorination))	5.0 ug/L
00720	Cyanide (grab not to exceed 24 hours) (total)	5.0 ug/L
00951	Fluoride	0.1 mg/L
01045	Iron (total)	0.5 mg/L
01046	Iron (Dissolved)	0.5 mg/L
01051	Lead	0.05 mg/L
01055	Manganese	0.5 mg/L
71900	Mercury (grab)**	1.0 ng/L*
01067	Nickel	0.005 mg/L
00556	Oil (hexane soluble or equivalent) (Grab Sample only)	5.0 mg/L
32730	Phenols (grab)	0.005 mg/L
01147	Selenium	0.005 mg/L
00945	Sulfate	10 mg/L
01077	Silver (total)	0.003 mg/L
01092	Zinc	0.025 mg/L

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Special Conditions

Unless otherwise indicated, concentrations refer to the total amount of the constituent present in all phases, whether solid, suspended or dissolved, elemental or combined, including all oxidation states.

*1.0 ng/L = 1 part per trillion.
**Utilize USEPA Method 1631E and the digestion procedure described in Section 11.1.1.2 of 1631E. Mercury shall be monitored monthly for the first two years and quarterly thereafter. This Permit may be modified with public notice to establish effluent limitations if appropriate, based on information obtained through sampling. The quarterly monitoring results shall be submitted on the March, June, September and December DMRs.
***USEPA Method OIA-1677

SPECIAL CONDITION 17. The effluent, alone or in combination with other sources, shall not cause a violation of any applicable water quality standard outlined in 35 Ill. Adm. Code 302.

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Standard Conditions

Definitions

Act means the Illinois Environmental Protection Act, 415 ILCS 5 as Amended.

Agency means the Illinois Environmental Protection Agency.

Board means the Illinois Pollution Control Board.

Clean Water Act (formerly referred to as the Federal Water Pollution Control Act) means Pub. L 92-500, as amended. 33 U.S.C. 1251 et seq.

NPDES (National Pollutant Discharge Elimination System) means the national program for issuing, modifying, revoking and reissuing, terminating, monitoring and enforcing permits, and imposing and enforcing pretreatment requirements, under Sections 307, 402, 318 and 405 of the Clean Water Act.

USEPA means the United States Environmental Protection Agency.

Daily Discharge means the discharge of a pollutant measured during a calendar day or any 24-hour period that reasonably represents the calendar day for purposes of sampling. For pollutants with limitations expressed in units of mass, the "daily discharge" is calculated as the total mass of the pollutant discharged over the day. For pollutants with limitations expressed in other units of measurements, the "daily discharge" is calculated as the average measurement of the pollutant over the day.

Maximum Daily Discharge Limitation (daily maximum) means the highest allowable daily discharge.

Average Monthly Discharge Limitation (30 day average) means the highest allowable average of daily discharges over a calendar month, calculated as the sum of all daily discharges measured during a calendar month divided by the number of daily discharges measured during that month.

Average Weekly Discharge Limitation (7 day average) means the highest allowable average of daily discharges over a calendar week, calculated as the sum of all daily discharges measured during a calendar week divided by the number of daily discharges measured during that week.

Best Management Practices (BMPs) means schedules of activities, prohibitions of practices, maintenance procedures, and other management practices to prevent or reduce the pollution of waters of the State. BMPs also include treatment requirements, operating procedures, and practices to control plant site runoff, spillage or leaks, sludge or waste disposal, or drainage from raw material storage.

Aliquot means a sample of specified volume used to make up a total composite sample.

Grab Sample means an individual sample of at least 100 milliliters collected at a randomly-selected time over a period not exceeding 15 minutes.

24-Hour Composite Sample means a combination of at least 8 sample aliquots of at least 100 milliliters, collected at periodic intervals during the operating hours of a facility over a 24-hour period.

8-Hour Composite Sample means a combination of at least 3 sample aliquots of at least 100 milliliters, collected at periodic intervals during the operating hours of a facility over an 8-hour period.

Flow Proportional Composite Sample means a combination of sample aliquots of at least 100 milliliters collected at periodic intervals such that either the time interval between each aliquot or the volume of each aliquot is proportional to either the stream flow at the time of sampling or the total stream flow since the collection of the previous aliquot.

(1) **Duty to comply.** The permittee must comply with all conditions of this permit. Any permit noncompliance constitutes a violation of the Act and is grounds for enforcement action, permit termination, revocation and reissuance, modification, or for denial of a permit renewal application. The permittee shall comply with effluent standards or prohibitions established under Section 307(a) of the Clean Water Act for toxic pollutants within the time provided in the regulations that establish these standards or prohibitions, even if the permit has not yet been modified to incorporate the requirements.

(2) **Duty to reapply.** If the permittee wishes to continue an activity regulated by this permit after the expiration date of this permit, the permittee must apply for and obtain a new permit. If the permittee submits a proper application as required by the Agency no later than 180 days prior to the expiration date, this permit shall continue in full force and effect until the final Agency decision on the application has been made.

(3) **Need to halt or reduce activity not a defense.** It shall not be a defense for a permittee in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this permit.

(4) **Duty to mitigate.** The permittee shall take all reasonable steps to minimize or prevent any discharge in violation of this permit which has a reasonable likelihood of adversely affecting human health or the environment.

(5) **Proper operation and maintenance.** The permittee shall at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) which are installed or used by the permittee to achieve compliance with conditions of this permit. Proper operation and maintenance includes effective performance, adequate funding, adequate operator staffing and training, and adequate laboratory and process controls, including appropriate quality assurance procedures. This provision requires the operation of back-up, or auxiliary facilities, or similar systems only when necessary to achieve compliance with the conditions of the permit.

(6) **Permit actions.** This permit may be modified, revoked and reissued, or terminated for cause by the Agency pursuant to 40 CFR 122.62 and 40 CFR 122.63. The filing of a request by the permittee for a permit modification, revocation and reissuance, or termination, or a notification of planned changes or anticipated noncompliance, does not stay any permit condition.

(7) **Property rights.** This permit does not convey any property rights of any sort, or any exclusive privilege.

(8) **Duty to provide information.** The permittee shall furnish to the Agency within a reasonable time, any information which the Agency may request to determine whether cause exists for modifying, revoking and reissuing, or terminating this permit, or to determine compliance with the permit. The permittee shall also furnish to the Agency upon request, copies of records required to be kept by this permit.

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(9) **Inspection and entry**. The permittee shall allow an authorized representative of the Agency or USEPA (including an authorized contractor acting as a representative of the Agency or USEPA), upon the presentation of credentials and other documents as may be required by law, to:

(a) Enter upon the permittee's premises where a regulated facility or activity is located or conducted, or where records must be kept under the conditions of this permit;

(b) Have access to and copy, at reasonable times, any records that must be kept under the conditions of this permit;

(c) Inspect at reasonable times any facilities, equipment (including monitoring and control equipment), practices, or operations regulated or required under this permit; and

(d) Sample or monitor at reasonable times, for the purpose of assuring permit compliance, or as otherwise authorized by the Act, any substances or parameters at any location.

(10) **Monitoring and records**.

(a) Samples and measurements taken for the purpose of monitoring shall be representative of the monitored activity.

(b) The permittee shall retain records of all monitoring information, including all calibration and maintenance records, and all original strip chart recordings for continuous monitoring instrumentation, copies of all reports required by this permit, and records of all data used to complete the application for this permit, for a period of at least 3 years from the date of this permit, measurement, report or application. Records related to the permittee's sewage sludge use and disposal activities shall be retained for a period of at least five years (or longer as required by 40 CFR Part 503). This period may be extended by request of the Agency or USEPA at any time.

(c) Records of monitoring information shall include:

(1) The date, exact place, and time of sampling or measurements;

(2) The individual(s) who performed the sampling or measurements;

(3) The date(s) analyses were performed;

(4) The individual(s) who performed the analyses;

(5) The analytical techniques or methods used; and

(6) The results of such analyses.

(d) Monitoring must be conducted according to test procedures approved under 40 CFR Part 136, unless other test procedures have been specified in this permit. Where no test procedure under 40 CFR Part 136 has been approved, the permittee must submit to the Agency a test method for approval. The permittee shall calibrate and perform maintenance procedures on all monitoring and analytical instrumentation at intervals to ensure accuracy of measurements.

(11) **Signatory requirement**. All applications, reports or information submitted to the Agency shall be signed and certified.

(a) **Application**. All permit applications shall be signed as follows:

(1) For a corporation: by a principal executive officer of at least the level of vice president or a person or position having overall responsibility for environmental matters for the corporation:

(2) For a partnership or sole proprietorship: by a general partner or the proprietor, respectively; or

(3) For a municipality, State, Federal, or other public agency: by either a principal executive officer or ranking elected official.

(b) **Reports**. All reports required by permits, or other information requested by the Agency shall be signed by a person described in paragraph (a) or by a duly authorized representative of that person. A person is a duly authorized representative only if:

(1) The authorization is made in writing by a person described in paragraph (a); and

(2) The authorization specifies either an individual or a position responsible for the overall operation of the facility, from which the discharge originates, such as a plant manager, superintendent or person of equivalent responsibility; and

(3) The written authorization is submitted to the Agency.

(c) **Changes of Authorization**. If an authorization under (b) is no longer accurate because a different individual or position has responsibility for the overall operation of the facility, a new authorization satisfying the requirements of (b) must be submitted to the Agency prior to or together with any reports, information, or applications to be signed by an authorized representative.

(d) **Certification**. Any person signing a document under paragraph (a) or (b) of this section shall make the following certification:

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

(12) **Reporting requirements**.

(a) **Planned changes**. The permittee shall give notice to the Agency as soon as possible of any planned physical alterations or additions to the permitted facility. Notice is required when:

(1) The alteration or addition to a permitted facility may meet one of the criteria for determining whether a facility is a new source pursuant to 40 CFR 122.29 (b); or

(2) The alteration or addition could significantly change the nature or increase the quantity of pollutants discharged. This notification applies to pollutants which are subject neither to effluent limitations in the permit, nor to notification requirements pursuant to 40 CFR 122.42 (a)(1).

(3) The alteration or addition results in a significant change in the permittee's sludge use or disposal practices, and such alteration, addition, or change may justify the application of permit conditions that are different from or absent in the existing permit, including notification of additional use or disposal sites not reported during the permit application process or not reported pursuant to an approved land application plan.

(b) **Anticipated noncompliance**. The permittee shall give advance notice to the Agency of any planned changes in the permitted facility or activity which may result in noncompliance with permit requirements.

(c) **Transfers**. This permit is not transferable to any person except after notice to the Agency.

(d) **Compliance schedules**. Reports of compliance or noncompliance with, or any progress reports on, interim and final requirements contained in any compliance schedule of this permit shall be submitted no later than 14 days following each schedule date.

(e) **Monitoring reports**. Monitoring results shall be reported at the intervals specified elsewhere in this permit.

(1) Monitoring results must be reported on a Discharge Monitoring Report (DMR).

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(2) If the permittee monitors any pollutant more frequently than required by the permit, using test procedures approved under 40 CFR 136 or as specified in the permit, the results of this monitoring shall be included in the calculation and reporting of the data submitted in the DMR.

(3) Calculations for all limitations which require averaging of measurements shall utilize an arithmetic mean unless otherwise specified by the Agency in the permit.

(f) **Twenty-four hour reporting.** The permittee shall report any noncompliance which may endanger health or the environment. Any information shall be provided orally within 24-hours from the time the permittee becomes aware of the circumstances. A written submission shall also be provided within 5 days of the time the permittee becomes aware of the circumstances. The written submission shall contain a description of the noncompliance and its cause; the period of noncompliance, including exact dates and time; and if the noncompliance has not been corrected, the anticipated time it is expected to continue; and steps taken or planned to reduce, eliminate, and prevent reoccurrence of the noncompliance. The following shall be included as information which must be reported within 24-hours:

(1) Any unanticipated bypass which exceeds any effluent limitation in the permit.

(2) Any upset which exceeds any effluent limitation in the permit.

(3) Violation of a maximum daily discharge limitation for any of the pollutants listed by the Agency in the permit or any pollutant which may endanger health or the environment.

The Agency may waive the written report on a case-by-case basis if the oral report has been received within 24-hours.

(g) **Other noncompliance.** The permittee shall report all instances of noncompliance not reported under paragraphs (12) (d), (e), or (f), at the time monitoring reports are submitted. The reports shall contain the information listed in paragraph (12) (f).

(h) **Other Information.** Where the permittee becomes aware that it failed to submit any relevant facts in a permit application, or submitted incorrect information in a permit application, or in any report to the Agency, it shall promptly submit such facts or information.

(13) **Bypass.**

(a) Definitions.

(1) Bypass means the intentional diversion of waste streams from any portion of a treatment facility.

(2) Severe property damage means substantial physical damage to property, damage to the treatment facilities which causes them to become inoperable, or substantial and permanent loss of natural resources which can reasonably be expected to occur in the absence of a bypass. Severe property damage does not mean economic loss caused by delays in production.

(b) Bypass not exceeding limitations. The permittee may allow any bypass to occur which does not cause effluent limitations to be exceeded, but only if it also is for essential maintenance to assure efficient operation. These bypasses are not subject to the provisions of paragraphs (13)(c) and (13)(d).

(c) Notice.

(1) Anticipated bypass. If the permittee knows in advance of the need for a bypass, it shall submit prior notice, if possible at least ten days before the date of the bypass.

(2) Unanticipated bypass. The permittee shall submit notice of an unanticipated bypass as required in paragraph (12)(f) (24-hour notice).

(d) Prohibition of bypass.

(1) Bypass is prohibited, and the Agency may take enforcement action against a permittee for bypass, unless:

(i) Bypass was unavoidable to prevent loss of life, personal injury, or severe property damage;

(ii) There were no feasible alternatives to the bypass, such as the use of auxiliary treatment facilities, retention of untreated wastes, or maintenance during normal periods of equipment downtime. This condition is not satisfied if adequate back-up equipment should have been installed in the exercise of reasonable engineering judgment to prevent a bypass which occurred during normal periods of equipment downtime or preventive maintenance; and

(iii) The permittee submitted notices as required under paragraph (13)(c).

(2) The Agency may approve an anticipated bypass, after considering its adverse effects, if the Agency determines that it will meet the three conditions listed above in paragraph (13)(d)(1).

(14) **Upset.**

(a) Definition. Upset means an exceptional incident in which there is unintentional and temporary noncompliance with technology based permit effluent limitations because of factors beyond the reasonable control of the permittee. An upset does not include noncompliance to the extent caused by operational error, improperly designed treatment facilities, inadequate treatment facilities, lack of preventive maintenance, or careless or improper operation.

(b) Effect of an upset. An upset constitutes an affirmative defense to an action brought for noncompliance with such technology based permit effluent limitations if the requirements of paragraph (14)(c) are met. No determination made during administrative review of claims that noncompliance was caused by upset, and before an action for noncompliance, is final administrative action subject to judicial review.

(c) Conditions necessary for a demonstration of upset. A permittee who wishes to establish the affirmative defense of upset shall demonstrate, through properly signed, contemporaneous operating logs, or other relevant evidence that:

(1) An upset occurred and that the permittee can identify the cause(s) of the upset;

(2) The permitted facility was at the time being properly operated; and

(3) The permittee submitted notice of the upset as required in paragraph (12)(f)(2) (24-hour notice).

(4) The permittee complied with any remedial measures required under paragraph (4).

(d) Burden of proof. In any enforcement proceeding the permittee seeking to establish the occurrence of an upset has the burden of proof.

(15) **Transfer of permits.** Permits may be transferred by modification or automatic transfer as described below:

(a) Transfers by modification. Except as provided in paragraph (b), a permit may be transferred by the permittee to a new owner or operator only if the permit has been modified or revoked and reissued pursuant to 40 CFR 122.62 (b) (2), or a minor modification made pursuant to 40 CFR 122.63 (d), to identify the new permittee and incorporate such other requirements as may be necessary under the Clean Water Act.

(b) Automatic transfers. As an alternative to transfers under paragraph (a), any NPDES permit may be automatically transferred to a new permittee if:

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(1) The current permittee notifies the Agency at least 30 days in advance of the proposed transfer date;
(2) The notice includes a written agreement between the existing and new permittees containing a specified date for transfer of permit responsibility, coverage and liability between the existing and new permittees; and
(3) The Agency does not notify the existing permittee and the proposed new permittee of its intent to modify or revoke and reissue the permit. If this notice is not received, the transfer is effective on the date specified in the agreement.

(16) All manufacturing, commercial, mining, and silvicultural dischargers must notify the Agency as soon as they know or have reason to believe:
(a) That any activity has occurred or will occur which would result in the discharge of any toxic pollutant identified under Section 307 of the Clean Water Act which is not limited in the permit, if that discharge will exceed the highest of the following notification levels:
(1) One hundred micrograms per liter (100 ug/l);
(2) Two hundred micrograms per liter (200 ug/l) for acrolein and acrylonitrile; five hundred micrograms per liter (500 ug/l) for 2,4-dinitrophenol and for 2-methyl-4,6 dinitrophenol; and one milligram per liter (1 mg/l) for antimony.
(3) Five (5) times the maximum concentration value reported for that pollutant in the NPDES permit application; or
(4) The level established by the Agency in this permit.
(b) That they have begun or expect to begin to use or manufacture as an intermediate or final product or byproduct any toxic pollutant which was not reported in the NPDES permit application.

(17) All Publicly Owned Treatment Works (POTWs) must provide adequate notice to the Agency of the following:
(a) Any new introduction of pollutants into that POTW from an indirect discharge which would be subject to Sections 301 or 306 of the Clean Water Act if it were directly discharging those pollutants; and
(b) Any substantial change in the volume or character of pollutants being introduced into that POTW by a source introducing pollutants into the POTW at the time of issuance of the permit.
(c) For purposes of this paragraph, adequate notice shall include information on (i) the quality and quantity of effluent introduced into the POTW, and (ii) any anticipated impact of the change on the quantity or quality of effluent to be discharged from the POTW.

(18) If the permit is issued to a publicly owned or publicly regulated treatment works, the permittee shall require any industrial user of such treatment works to comply with federal requirements concerning:
(a) User charges pursuant to Section 204 (b) of the Clean Water Act, and applicable regulations appearing in 40 CFR 35;
(b) Toxic pollutant effluent standards and pretreatment standards pursuant to Section 307 of the Clean Water Act; and
(c) Inspection, monitoring and entry pursuant to Section 308 of the Clean Water Act.

(19) If an applicable standard or limitation is promulgated under Section 301(b)(2)(C) and (D), 304(b)(2), or 307(a)(2) and that effluent standard or limitation is more stringent than any effluent limitation in the permit, or controls a pollutant not limited in the permit, the permit shall be promptly modified or revoked, and reissued to conform to that effluent standard or limitation.

(20) Any authorization to construct issued to the permittee pursuant to 35 Ill. Adm. Code 309.154 is hereby incorporated by reference as a condition of this permit.

(21) The permittee shall not make any false statement, representation or certification in any application, record, report, plan or other document submitted to the Agency or the USEPA, or required to be maintained under this permit.

(22) The Clean Water Act provides that any person who violates a permit condition implementing Sections 301, 302, 306, 307, 308, 318, or 405 of the Clean Water Act is subject to a civil penalty not to exceed $25,000 per day of such violation. Any person who willfully or negligently violates permit conditions implementing Sections 301, 302, 306, 307, 308, 318 or 405 of the Clean Water Act is subject to a fine of not less than $2,500 nor more than $25,000 per day of violation, or by imprisonment for not more than one year, or both.
Additional penalties for violating these sections of the Clean Water Act are identified in 40 CFR 122.41 (a)(2) and (3).

(23) The Clean Water Act provides that any person who falsifies, tampers with, or knowingly renders inaccurate any monitoring device or method required to be maintained under this permit shall, upon conviction, be punished by a fine of not more than $10,000, or by imprisonment for not more than 2 years, or both. If a conviction of a person is for a violation committed after a first conviction of such person under this paragraph, punishment is a fine of not more than $20,000 per day of violation, or by imprisonment of not more than 4 years, or both.

(24) The Clean Water Act provides that any person who knowingly makes any false statement, representation, or certification in any record or other document submitted or required to be maintained under this permit, including monitoring reports or reports of compliance or non-compliance shall, upon conviction, be punished by a fine of not more than $10,000 per violation, or by imprisonment for not more than 6 months per violation, or by both.

(25) Collected screening, slurries, sludges, and other solids shall be disposed of in such a manner as to prevent entry of those wastes (or runoff from the wastes) into waters of the State. The proper authorization for such disposal shall be obtained from the Agency and is incorporated as part hereof by reference.

(26) In case of conflict between these standard conditions and any other condition(s) included in this permit, the other condition(s) shall govern.

(27) The permittee shall comply with, in addition to the requirements of the permit, all applicable provisions of 35 Ill. Adm. Code, Subtitle C, Subtitle D, Subtitle E, and all applicable orders of the Board or any court with jurisdiction.

(28) The provisions of this permit are severable, and if any provision of this permit, or the application of any provision of this permit is held invalid, the remaining provisions of this permit shall continue in full force and effect.

(Rev. 7-9-2010 bah)

Illinois Environmental Protection Agency

Public Notice Order Form

Division: Water Pollution Control **Dept:** Permit Section

Ordered by: Belinda A. Hafliger **Phone:** 217-782-0610 **Fax:** 217-782-9891

Ad number or Public Notice Number: JAR:15042301

Newspaper or Location: Paper closest to facility address

Date(s) to be placed: _____ **Ad Size:** _____

Special Instructions: Run Canned Ad One Day for IL0002259

Signature: Belinda A. Hafliger **Date:** February 14, 2017

Please attach ad copy and mail or fax to Illinois Press Advertising Service.

Illinois Press Advertising Service
900 Community Drive
Springfield, IL 62703
Phone: 217-241-1700 (Madelyn Ext. 229)
FAX: 217-241-1701
Email Address: mhewitt@il-press.com

Public Notice to Appear in: Lawrence Lake County On: 2-17-2017
(Name of Newspaper) (Date)
News Sun

Public Notice of Draft Permit

Public Notice Number JAR:15042301 is hereby given by Illinois EPA, Division of Water Pollution Control, Permit Section, 1021 North Grand Avenue East, Post Office Box 19276, Springfield, Illinois 62794-9276 (herein Agency) that a draft modified National Pollutant Discharge Elimination System (NPDES) Permit Number IL0002259 has been prepared under 40 CFR 124.6(d) for Midwest Generation, LLC for discharge into Lake Michigan from the Waukegan Generating Station, 401 East Greenwood Ave., Waukegan, Illinois 60087, (Lake County).

The station operates two coal fired boilers to supply steam to two generating units, designated units 7 and 8 with a combined nominal capacity of 742 MW. The station withdraws water from Lake Michigan for condenser cooling, house service water and boiler feed water. Wastewater is generated from once-through condenser cooling, conditioning boiler feed water, backwashing the condenser cooling water intake screens, non-chemical cleaning of plant equipment, ash handling, and precipitation which contacts the site.

Plant operation results in an average discharge of 739 MGD of condenser cooling water and house service water from outfall 001, an intermittent discharge of boiler blowdown from outfall A01, 0.06 MGD of reverse osmosis wastes from outfall B01, 8.13 MGD of wastewater treatment system effluent from outfall C01, 0.676 MGD of east yard basin overflow from outfall D01, an intermittent discharge of unit 7 demineralized water storage tank drain from outfall F01, and an intermittent discharge of non-chemical metal cleaning wastes from outfall G01.

The application, draft permit and other documents are available for inspection and may be copied at the Agency between 9:30 a.m. and 3:30 p.m. Monday through Friday. A Fact Sheet containing more detailed information is available at no charge. For further information, call the Public Notice Clerk at 217/782-0610.

Interested persons are invited to submit written comments on the draft permit to the Agency at the above address. The NPDES Permit and Joint Public Notice numbers must appear on each comment page. All comments received by the Agency not later than 30 days from the date of this publication shall be considered in making the final decision regarding permit issuance.

Any interested person may submit written request for a public hearing on the draft

If written comments and/or requests indicate a significant degree of public interest in the draft permit, the permitting authority may, at its discretion, hold a public hearing. Public notice will be given 30 days before any public hearing.

Electronic Filing: Received, Clerk's Office 10/31/2022

ILLINOIS ENVIRONMENTAL PROTECTION AGENCY

1021 NORTH GRAND AVENUE EAST, P.O. BOX 19276, SPRINGFIELD, ILLINOIS 62794-9276 • (217) 782-3397
BRUCE RAUNER, GOVERNOR ALEC MESSINA, ACTING DIRECTOR

217/782-0610

February 17, 2017

Edward Karecki
U.S. Fish and Wildlife Service
Chicago Field Office
230 S. Dearborn St., Suite 2938
Chicago, Illinois 60604

Re: Waukegan Generating Station
NPDES Permit No. IL0002259

Gentlemen

In accordance with 40 CFR 124.10, we hereby submit a copy of the Public Notice/Fact Sheet for the above discharger. If no written reply is received at the indicated address, attention: NPDES PN Clerk within 30 days of the date of this request, the Agency will assume that the U.S. Fish and Wildlife Service has no objection to the proposed discharge.

Sincerely,

Darin E. LeCrone, P.E.
Manager, Industrial Unit
Division of Water Pollution Control

DEL:JAR:15042301

Attachments: Public Notice/Fact Sheet

cc: Records Unit

4302 N. Main St., Rockford, IL 61103 (815) 987-7760
9511 Harrison St., Des Plaines, IL 60016 (847) 294-4000
595 S. State, Elgin, IL 60123 (847) 608-3131
2125 S. First St., Champaign, IL 61820 (217) 278-5800
2009 Mall St., Collinsville, IL 62234 (618) 346-5120
412 SW Washington St., Suite D, Peoria, IL 61602 (309) 671-3022
2309 W. Main St., Suite 116, Marion, IL 62959 (618) 993-7200
100 W. Randolph, Suite 10-300, Chicago, IL 60601

PLEASE PRINT ON RECYCLED PAPER

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ILLINOIS ENVIRONMENTAL PROTECTION AGENCY

1021 NORTH GRAND AVENUE EAST, P.O. BOX 19276, SPRINGFIELD, ILLINOIS 62794-9276 • (217) 782-3397
BRUCE RAUNER, GOVERNOR ALEC MESSINA, ACTING DIRECTOR

217/782-0610

February 17, 2017

Municipal Clerk
100 N. Martin Luther King Jr. Ave.
Waukegan, IL 60085

Re: Waukegan Generating Station
NPDES Permit No. IL0002259
Public Notice of Permit

Municipal Clerk:

In accordance with the requirements of the Illinois Pollution Control Board regulations of 35 Ill. Adm. Code 309.109(a)(2)(A), the attached National Pollutant Discharge Elimination System Public Notice is sent to a municipality in the vicinity of the applicant. The Agency understands that the applicant may not be associated with the municipality to which it is sent.

Please post the attached National Pollutant Discharge Elimination System Public Notice for a period of 30 days. In addition, please complete and return the enclosed postcard indicating the date of posting. Should you choose not to post the attached notice, please indicate so on the postcard and return.

Thank you for your cooperation.

Sincerely,

Darin E. LeCrone, P.E.
Manager, Industrial Unit
Division of Water Pollution Control

DEL:JAR:15042301

Attachments: Public Notice/Fact Sheet

cc: Records Unit

4302 N. Main St., Rockford, IL 61103 (815) 987-7760
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ILLINOIS ENVIRONMENTAL PROTECTION AGENCY

1021 NORTH GRAND AVENUE EAST, P.O. BOX 19276, SPRINGFIELD, ILLINOIS 62794-9276 • (217) 782-3397
BRUCE RAUNER, GOVERNOR ALEC MESSINA, ACTING DIRECTOR

217/782-0610

February 17, 2017

MAJOR

Midwest Generation, LLC
401 East Greenwood Ave.
Waukegan, IL 60087

Re: Waukegan Generating Station
NPDES Permit No. IL0002259
Public Notice Permit

Gentlemen:

Please post the attached Public Notice for the subject discharge for at least a period of thirty days from the date on the Notice in a conspicuous place on your premises.

We have enclosed a copy of the draft NPDES permit on which this official Public Notice is based. If you wish to comment on the draft permit, please do so within 30 days of the Public Notice date. If there are any questions, please contact Jaime Rabins at the indicated telephone number and address.

Thank you for your cooperation.

Sincerely,

Darin E. LeCrone, P.E.
Manager, Industrial Unit
Division of Water Pollution Control

DEL:JAR:15042301

Attachments: Draft Permit, Public Notice/Fact Sheet

cc: Records Unit
Des Plaines FOS
Compliance Assurance Section
CMAP
US EPA

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NPDES Permit No. IL0002259
Notice No. JAR:15042301

Public Notice Beginning Date: **February 17, 2017**

Public Notice Ending Date: **March 20, 2017**

National Pollutant Discharge Elimination System (NPDES)
Permit Program

Draft Modified NPDES Permit to Discharge into Waters of the State

Public Notice/Fact Sheet Issued By:

Illinois Environmental Protection Agency
Bureau of Water,
Division of Water Pollution Control
Permit Section
1021 North Grand Avenue East
Post Office Box 19276
Springfield, Illinois 62794-9276
217/782-0610

Name and Address of Discharger:

Midwest Generation, LLC
401 East Greenwood Ave.
Waukegan, IL 60087

Name and Address of Facility:

Midwest Generation, LLC
Waukegan Generating Station
401 East Greenwood Ave.
Waukegan, Illinois 60087
(Lake County)

The Illinois Environmental Protection Agency (IEPA) has made a tentative determination to issue a NPDES permit to discharge into the waters of the state and has prepared a draft permit and associated fact sheet for the above named discharger. The Public Notice period will begin and end on the dates indicated in the heading of this Public Notice/Fact Sheet. The last day comments will be received will be on the Public Notice period ending date unless a commentor demonstrating the need for additional time requests an extension to this comment period and the request is granted by the IEPA. Interested persons are invited to submit written comments on the draft permit to the IEPA at the above address. Commentors shall provide his or her name and address and the nature of the issues proposed to be raised and the evidence proposed to be presented with regards to those issues. Commentors may include a request for public hearing. Persons submitting comments and/or requests for public hearing shall also send a copy of such comments or requests to the permit applicant. The NPDES permit and notice number(s) must appear on each comment page.

The application, engineer's review notes including load limit calculations, Public Notice/Fact Sheet, draft permit, comments received, and other documents are available for inspection and may be copied at the IEPA between 9:30 a.m. and 3:30 p.m. Monday through Friday when scheduled by the interested person.

If written comments or requests indicate a significant degree of public interest in the draft permit, the permitting authority may, at its discretion, hold a public hearing. Public notice will be given 45 days before any public hearing. Response to comments will be provided when the final permit is issued. For further information, please call Jaime Rabins at 217/782-0610.

The applicant is engaged operation of a steam electric generating station (SIC 4911). The station operates two coal fired boilers to supply steam to two generating units, designated units 7 and 8 with a combined nominal capacity of 742 MW. The station withdraws water from Lake Michigan for condenser cooling, house service water and boiler feed water. Wastewater is generated from once-through condenser cooling, conditioning boiler feed water, backwashing the condenser cooling water intake screens, non-chemical cleaning of plant equipment, ash handling, and precipitation which contacts the site.

Plant operation results in an average discharge of 739 MGD of condenser cooling water and house service water from outfall 001, an intermittent discharge of boiler blowdown from outfall A01, 0.06 MGD of reverse osmosis wastes from outfall B01, 8.13 MGD of wastewater treatment system effluent from outfall C01, 0.676 MGD of east yard basin overflow from outfall D01, an intermittent discharge of unit 7 demineralized water storage tank drain from outfall F01, and an intermittent discharge of non-chemical metal cleaning wastes from outfall G01.

The following modifications are proposed:

1. A new discharge of 800 gpd of Trona Mill Wash from outfall D01.
2. In special condition 16 the minimum reporting limit for chloride will be changed to 1 mg/l and the minimum reporting limit for sulfate will be changed to 10 mg/l which are the minimum reporting limits the IEPA labs use for those pollutants.

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3. Removal of Ion Exchange discharges and replacement with RO discharges tributary to outfall B01. Demineralizer filter backwash outfall C01 subwastestream 6e was renamed RO filter backwash. Demineralizer filter backwash outfall D01 subwastestream 4 was renamed RO filter backwash.
4. Special Condition 6 was revised to reflect the new Electronic Reporting Rule.

Application is made for the existing discharges which is located in Lake County, Illinois. The following information identifies the discharge point, receiving stream and stream classifications:

Outfall	Receiving Stream	Latitude	Longitude	Stream Classification	Integrity Rating
001	Lake Michigan	42° 23' 00" North	87° 48' 15" West	Lake Michigan Basin	Not Rated

To assist you further in identifying the location of the discharge please see the attached map.

Lake Michigan (segment code QH-04) has a 7Q10 flow of zero cfs and is a Lake Michigan Basin water. Lake Michigan is listed on the draft 2016 Illinois Integrated Water Quality Report and Section 303(d) List as impaired for fish consumption and primary contact uses. Causes of fish consumption use impairment are given as mercury and PCBs. The cause of primary contact use impairment is given as fecal coliform bacteria. Aquatic life use is not assessed. Lake Michigan is not listed as a biologically significant stream in the 2008 Illinois Department of Natural Resources Publication *Integrating Multiple Taxa in a Biological Stream Rating System* nor is it given an integrity rating in that publication for this location. Lake Michigan is not designated as an enhanced water pursuant to the dissolved oxygen water quality standard at this location.

The discharge(s) from the facility shall be monitored and limited at all times as follows:

	LOAD LIMITS lbs/day DAF (DMF)			CONCENTRATION LIMITS mg/l		
PARAMETER	30 DAY AVERAGE	DAILY MAXIMUM	REGULATION	30 DAY AVERAGE	DAILY MAXIMUM	REGULATION
Outfall 001: Condenser Cooling Water and House Service Water (DAF = 739 MGD)						
Flow (MGD)						
pH						35 IAC 302.503
Total Residual Chlorine					0.05	40 CFR 125.3
Temperature						35 IAC 309.146
Mercury						35 IAC 309.146
Outfall A01: Boiler Blowdown (Intermittent Discharge)						
Flow (MGD)						
Total Suspended Solids				15	30	35 IAC 304.124
Oil and Grease				15	20	40CFR423.12(b)(3)
Outfall B01: Reverse Osmosis Wastes (DAF = 0.06 MGD)						
Flow (MGD)						
Total Suspended Solids				15	30	35 IAC 304.124
Oil and Grease				15	20	40CFR423.12(b)(3)
Outfall C01: Wastewater Treatment System (DAF = 8.13 MGD)						
Flow (MGD)						
Total Suspended Solids				15	30	35 IAC 304.124
Oil and Grease				15	20	40CFR423.12(b)(3)
Outfall D01: East Yard Collection Basin Overflow (DAF = 0.676 MGD)						

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FEB 17 2017
PUBLIC NOTICE

PARAMETER	LOAD LIMITS lbs/day DAF (DMF) 30 DAY AVERAGE	LOAD LIMITS lbs/day DAF (DMF) DAILY MAXIMUM	REGULATION	CONCENTRATION LIMITS mg/l 30 DAY AVERAGE	CONCENTRATION LIMITS mg/l DAILY MAXIMUM	REGULATION
Flow (MGD)						
Total Suspended Solids				15	30	35 IAC 304.124
Oil and Grease				15	20	40CFR423.12(b)(3)
Outfall F01: Unit 7 Demineralized Water Storage Tank Drain(Intermittent Discharge)						
Flow (MGD)						
Total Suspended Solids				15	30	35 IAC 304.124
Oil and Grease				15	20	40CFR423.12(b)(3)
Outfall G01: Non-Chemical Metal Cleaning Wastes (Intermittent Discharge)						
Flow (MGD)						
Total Suspended Solids				30	100	40CFR423.12(b)(5)
Oil and Grease				15	20	40CFR423.12(b)(5)
Iron				1.0	1.0	40CFR423.12(b)(5)
Copper				1.0	1.0	40CFR423.12(b)(5)

The following explain the conditions of the proposed permit:

The special conditions clarify: flow reporting, pH, monitoring location, discharge monitoring reports, usage of water treatment additives, re-opening of the permit and temperature.

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Antidegradation Assessment for Trona Mill Wash Water
Waukegan Generating Station NPDES Permit No. IL0002259 Lake County

The subject facility has applied for a modification of the NPDES permit to include wastewater generated as part of an air emission control process and the roof and floor drains associated with the Trona mill building. The subject facility is installing a dry sorbent injection flue gas desulfurization system to minimize atmospheric discharges of sulfur dioxide and acid gasses. Trona ($Na_2CO_3 \bullet NaHCO_3 \bullet 2H_2O$) will be milled and blown into the flue gas ductwork using injection lances. In order to ensure the efficiency of the milling process, the Trona mills and immediately surrounding areas will have to go through daily wash cycles of approximately 100 gallons of water, per wash. This wastewater will only contain Trona, at an approximate concentration of about 3%. All of the fly ash handling system is dry; therefore any Trona that has been used to control SO_2 emissions will be disposed of offsite.

The amount of Trona used at any given time will vary as a function of its effectiveness in controlling SO_2 emissions. The amount of Trona mill washes is a function of the number of Trona mills used for each boiler. At Waukegan Station, once the full Trona injection system is completed, there will be an estimated maximum of 18 washes per day, at 100 gallons of water per wash, for a maximum of 1800 gallons of wash water per day to be introduced into the existing wastewater treatment system. The estimated average Trona mill wash water flow is 800 gallons/day.

However, total suspended solids are not expected in the effluent, due to the high solubility of this product. The wash water from the milling process will undergo setting within the East Yard Basin (Internal Outfall D01) and would then be sent to Outfall 001.

The information in this antidegradation assessment came from the September 2014 antidegradation assessment by Midwest Generation, titled Waukegan Generating Station – NPDES Permit No. IL0002259 Anti-Degradation Assessment".

Identification and Characterization of the Affected Water Body.

Lake Michigan (segment code QH-04) has a 7Q10 flow of zero cfs and is a Lake Michigan Basin water. Lake Michigan is listed on the draft 2016 Illinois Integrated Water Quality Report and Section 303(d) List as impaired for fish consumption and primary contact uses. Causes of fish consumption use impairment are given as mercury and PCBs. The cause of primary contact use impairment is given as fecal coliform bacteria. Aquatic life use is not assessed. Lake Michigan is not listed as a biologically significant stream in the 2008 Illinois Department of Natural Resources Publication *Integrating Multiple Taxa in a Biological Stream Rating System* nor is it given an integrity rating in that publication for this location. Lake Michigan is not designated as an enhanced water pursuant to the dissolved oxygen water quality standard at this location.

Identification of Proposed Pollutant Load Increases or Potential Impacts on Uses.

Existing Total Suspended Solids and pH permit limits will continue to be regulated. With the treatment provided within the East Yard Basin, a measurable increase in pH is not expected to occur at Outfall 001.

Fate and Effect of Parameters Proposed for Increased Loading.

Given that negligible, if any, additional pollutant loading would occur as a result of this proposed modification; an adverse impact to the existing uses of the receiving water is not anticipated.

The expected concentration of Trona in the effluent would be non-detectable, and therefore, there will be no measurable pollutant loading to the receiving stream as the result of the proposed wash water, and therefore no impact on existing uses and water quality of the receiving stream.

Purpose and Social & Economic Benefits of the Proposed Activity.

The Trona mill wash water is a byproduct of the advanced air control measures that Waukegan Station will employ to reduce emissions of sulfur dioxide and acid gases. This air emissions control technology installation (the basis of the requested Trona mill washwater addition) would benefit the environment by minimizing the loading of these pollutants to the atmosphere, and subsequently minimizing the atmospheric deposition of these pollutant into the Lake Michigan Basin and other regional watersheds.

Assessments of Alternatives for Less Increase in Loading or Minimal Environmental Degradation.

The facility evaluated applying the Trona washwater around the reclaim area of the coal pile. The reclaim area is where the coal process input point leading directly to the boilers where the coal will be combusted. The facility also evaluated collecting the water and sending it off-site for treatment. Neither of these alternatives was deemed feasible.

Summary Comments of the Illinois Department of Natural Resources, Regional Planning Commissions, Zoning Boards or Other Entities.

On September 9, 2014, the IDNR EcoCAT web-based tool was used and indicated that there were endangered/threatened resources (Illinois Beach INAI Site, Waukegan Beach INAI Site, Illinois Beach Nature Preserve, Bearberry (*Arctostaphylos uva-ursi*), Black-Crowned Night Heron (*Nycticorax nycticorax*), Blanding's Turtle (*Emydoidea blandingii*), Common Tern (*Sterna hirundo*), Least Bittern (*Ixobrychus exilis*), Marram Grass (*Ammophila breviligulata*), Peregrine Falcon (*Falco peregrinus*), Piping Plover (*Charadrus melodus*), Richardson's

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Rush (*Juncus alpinoarticulatus*), Sea Rocket (*Cakile edentula*), Seaside Spurge (*Chamaesyce polygonifolia*), and Upland Sandpiper (*Bartramia longicauda*))present in the vicinity of the discharge. IDNR evaluated the submittal and determined that impacts to the protected resources are unlikely. IDNR terminated the consultation request on September 11, 2014.

PUBLIC NOTICE

Agency Conclusion.

This preliminary assessment was conducted pursuant to the Illinois Pollution Control Board regulation for Antidegradation found at 35 Ill. Adm. Code 302.105 (antidegradation standard) and was based on the information available to the Agency at the time the draft permit was written. We tentatively find that the proposed activity will result in the attainment of water quality standards; that all existing uses of the receiving stream will be maintained; that all technically and economically reasonable measures to avoid or minimize the extent of the proposed increase in pollutant loading have been incorporated into the proposed activity; and that this activity will benefit the community at large by minimizing the loading of sulfur dioxide and acid gases to the atmosphere, and subsequently minimizing the atmospheric deposition of these pollutant into the Illinois River and other regional watersheds. Comments received during the NPDES permit public notice period will be evaluated before a final decision is made by the Agency.

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Antidegradation Assessment for Transformation from Ion Exchange to Reverse Osmosis
Waukegan Generating Station NPDES Permit No. IL0002259 Lake County

The subject facility has applied for a permit modification to allow the transformation from ion exchange to reverse osmosis (RO) for boiler water treatment. The change involves Outfall B01, which reports to Outfall 001. The existing ion exchange demineralizer will be replaced by two RO units, one serving as a back-up. Water is withdrawn from Lake Michigan for the old and new systems. Slightly more water is required for the RO system and the discharge will increase from 0.044 MGD to 0.06 MGD. However, because the ion exchange system required the use of sulfuric acid and sodium hydroxide, discharge of sulfate and total dissolved solids will be greatly reduced by the RO system. The RO system will require hydrochloric and peracetic acid containing cleaning solutions and because of this chloride loading in the discharge will increase slightly. This review relies on information contained in a letter dated August 31, 2016 provided by the applicant.

Identification and Characterization of the Affected Water Body.

Lake Michigan (segment code QH-04) has a 7Q10 flow of zero cfs and is a Lake Michigan Basin water. Lake Michigan is listed on the draft 2016 Illinois Integrated Water Quality Report and Section 303(d) List as impaired for fish consumption and primary contact uses. Causes of fish consumption use impairment are given as mercury and PCBs. The cause of primary contact use impairment is given as fecal coliform bacteria. Aquatic life use is not assessed. Lake Michigan is not listed as a biologically significant stream in the 2008 Illinois Department of Natural Resources Publication *Integrating Multiple Taxa in a Biological Stream Rating System* nor is it given an integrity rating in that publication for this location. Lake Michigan is not designated as an enhanced water pursuant to the dissolved oxygen water quality standard at this location.

Identification of Proposed Pollutant Load Increases or Potential Impacts on Uses.

The parameter with an increase in loading is chloride. Loading of chloride will increase from 25 pounds per day currently to 30 ppd. This is because the RO system is cleaned in part using hydrochloric acid. While chloride loading rises very slightly, sulfate load decreases by 2059 ppd. Slightly more lake water will be pumped for operation of the RO system. No adverse impact on the uses of Lake Michigan is anticipated.

Fate and Effect of Parameters Proposed for Increased Loading.

The added chloride will persist in Lake Michigan. The additional amount of chloride added will be dissipated quickly and will not be measurable after mixing with cooling water prior to discharge.

Purpose and Social & Economic Benefits of the Proposed Activity.

Illinois EPA encourages companies to convert ion exchange softening to RO. The environment benefits from less dissolved substances in discharges and reduced transportation of chemicals on roads and rails. The slight increase in chloride is offset many times over by the reduction in sulfate. Conversion to RO water softening will help allow the facility to remain viable and will therefore preserve jobs.

Assessments of Alternatives for Less Increase in Loading or Minimal Environmental Degradation.

There is very little downside to the change from ion exchange to RO water softening. Alternatives to avoid the discharge of slightly increased chloride loading would be so onerous that the facility would chose to retain the existing ion exchange mode of water softening.

Summary Comments of the Illinois Department of Natural Resources, Regional Planning Commissions, Zoning Boards or Other Entities

The Illinois Department of Natural Resources was consulted regarding threatened and endangered species issues for the discharge location via the EcoCAT system on October 17, 2016. Endangered species are known from the terrestrial areas around Lake Michigan at this location. Other endangered species, a turtle and five species of birds, are dependent on water but are not likely found in the habitat near the discharge. IDNR responded to the endangered species consultation in a letter dated October 28, 2016 that terminated consultation.

Agency Conclusion.

This preliminary assessment was conducted pursuant to the Illinois Pollution Control Board regulation for Antidegradation found at 35 Ill. Adm. Code 302.105 (antidegradation standard) and was based on the information available to the Agency at the time the draft permit was written. We tentatively find that the proposed activity will result in the attainment of water quality standards; that all existing uses of the receiving waters will be maintained; that all technically and economically reasonable measures to avoid or minimize the extent of the proposed increase in pollutant loading have been incorporated into the proposed activity; and that this activity will benefit the local community by preserving jobs. Comments received during the NPDES permit public notice period will be evaluated before a final decision is made by the Agency.

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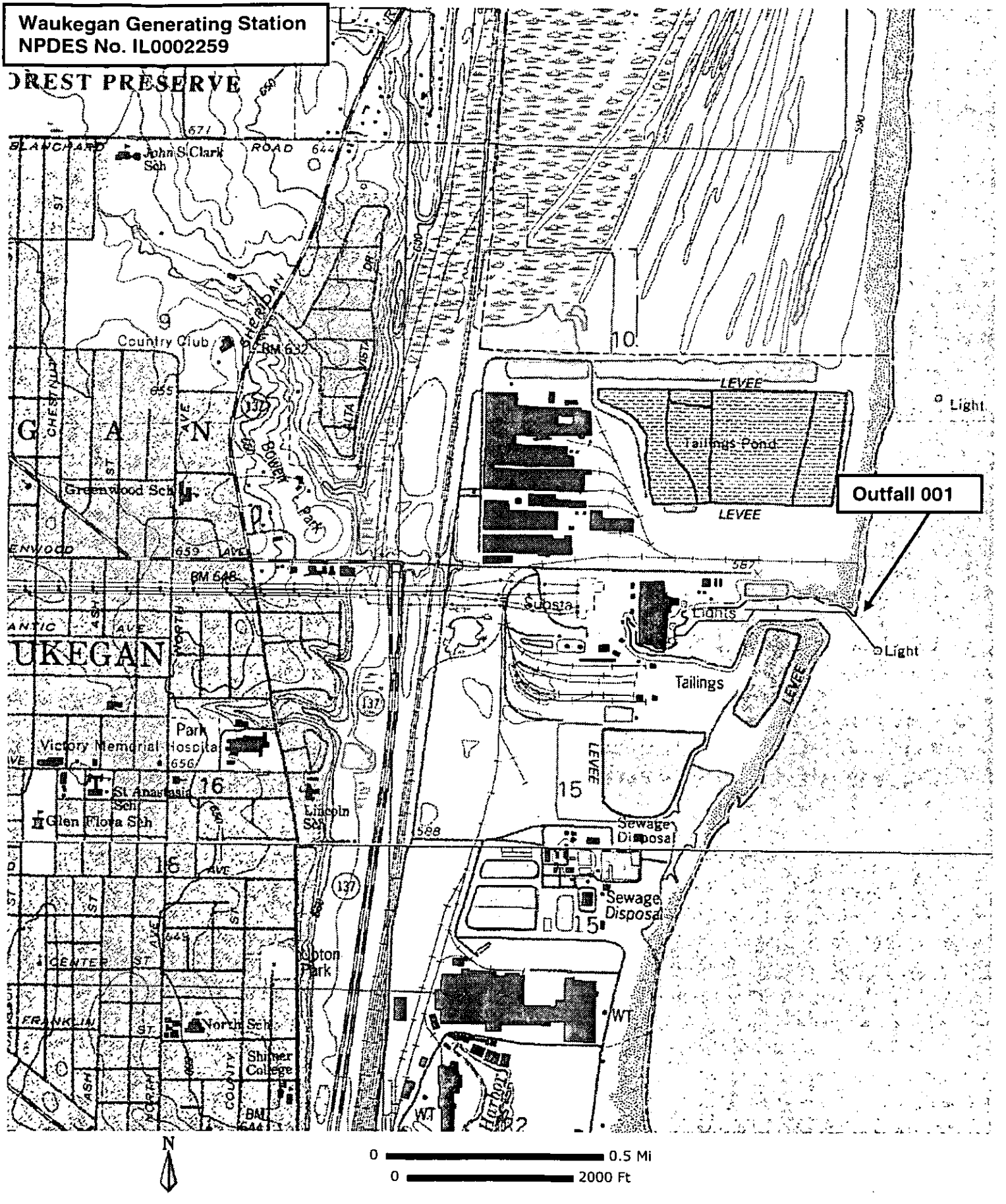
PUBLIC NOTICE

Sodium hydroxide, hydrochloric acid, citric acid, Vitec 3000 (scale inhibitor): These products have been previously reviewed and approved for use at this facility. Small increases in usage resulting from operation and cleaning of the RO system would not adversely affect aquatic life in the receiving water or require revised permit limitations.

Peracetic acid: The product is a disinfectant that would be used for maintenance cleaning of the RO membranes every 2-4 days. The product would be dosed at a maximum concentration of 1,000 ppm into 600 gallons of cleaning water, with the RO membranes being soaked in the cleaning solution to maximize disinfection. The spent cleaning solution would be sent to Outfall B01 and internally dilute with Outfall 001 effluent prior to discharge. The worst case discharge concertation of the product would be 0.3 ppm, which is roughly equivalent to the acute toxicity of peracetic acid (based on information ascertained from on-going regional efforts to develop criteria for this substance). However, the actual peracetic acid concertation at Outfall 001 would be far lower, and likely non-detect, after interacting with RO membranes as well as any residual organic material in B01/001 effluent.


Waukegan Generating Station
NPDES No. IL0002259
Outfall 001
LEVEE
Tailings Pond
Tailings
Substa
Lights
Light
Sewage Disposal
WT
Country Club
Greenwood Sch
Victory Memorial Hospital
St Anastasia Sch
Glen Flora Sch
Lincoln Sch
Clinton Park
North Sch
Shiner College
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FEB 17 2017

Public Notice of Draft Permit

PUBLIC NOTICE

Public Notice Number JAR:15042301 is hereby given by Illinois EPA, Division of Water Pollution Control, Permit Section, 1021 North Grand Avenue East, Post Office Box 19276, Springfield, Illinois 62794-9276 (herein Agency) that a draft modified National Pollutant Discharge Elimination System (NPDES) Permit Number IL0002259 has been prepared under 40 CFR 124.6(d) for Midwest Generation, LLC for discharge into Lake Michigan from the Waukegan Generating Station, 401 East Greenwood Ave., Waukegan, Illinois 60087, (Lake County).

The station operates two coal fired boilers to supply steam to two generating units, designated units 7 and 8 with a combined nominal capacity of 742 MW. The station withdraws water from Lake Michigan for condenser cooling, house service water and boiler feed water. Wastewater is generated from once-through condenser cooling, conditioning boiler feed water, backwashing the condenser cooling water intake screens, non-chemical cleaning of plant equipment, ash handling, and precipitation which contacts the site.

Plant operation results in an average discharge of 739 MGD of condenser cooling water and house service water from outfall 001, an intermittent discharge of boiler blowdown from outfall A01, 0.06 MGD of reverse osmosis wastes from outfall B01, 8.13 MGD of wastewater treatment system effluent from outfall C01, 0.676 MGD of east yard basin overflow from outfall D01, an intermittent discharge of unit 7 demineralized water storage tank drain from outfall F01, and an intermittent discharge of non-chemical metal cleaning wastes from outfall G01.

The application, draft permit and other documents are available for inspection and may be copied at the Agency between 9:30 a.m. and 3:30 p.m. Monday through Friday. A Fact Sheet containing more detailed information is available at no charge. For further information, call the Public Notice Clerk at 217/782-0610.

Interested persons are invited to submit written comments on the draft permit to the Agency at the above address. The NPDES Permit and Joint Public Notice numbers must appear on each comment page. All comments received by the Agency not later than 30 days from the date of this publication shall be considered in making the final decision regarding permit issuance.

Any interested person may submit written request for a public hearing on the draft

If written comments and/or requests indicate a significant degree of public interest in the draft permit, the permitting authority may, at its discretion, hold a public hearing. Public notice will be given 30 days before any public hearing.

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PUBLIC NOTICE

NPDES Permit No. IL0002259

Illinois Environmental Protection Agency

Division of Water Pollution Control

1021 North Grand Avenue East

Post Office Box 19276

Springfield, Illinois 62794-9276

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM

Modified (NPDES) Permit

Expiration Date: March 31, 2020

Issue Date: March 25, 2015
Modification Date:

Name and Address of Permittee:

Midwest Generation, LLC
401 East Greenwood Ave.
Waukegan, IL 60087

Facility Name and Address:

Midwest Generation, LLC
Waukegan Generating Station
401 East Greenwood Ave.
Waukegan, Illinois 60087
(Lake County)

Discharge Number and Name:

001 Condenser Cooling Water and House Service Water
A01 Boiler Blowdown
B01 Reverse Osmosis Wastes
C01 Wastewater Treatment System
D01 East Yard Collection Basin Overflow
F01 Unit 7 Demineralized Water Storage Tank Drain
G01 Non-Chemical Metal Cleaning Wastes

Receiving Waters:

Lake Michigan

In compliance with the provisions of the Illinois Environmental Protection Act, Title 35 of Ill. Adm. Code, Subtitle C and/or Subtitle D, Chapter 1, and the Clean Water Act (CWA), the above-named permittee is hereby authorized to discharge at the above location to the above-named receiving stream in accordance with the standard conditions and attachments herein.

Permittee is not authorized to discharge after the above expiration date. In order to receive authorization to discharge beyond the expiration date, the permittee shall submit the proper application as required by the Illinois Environmental Protection Agency (IEPA) not later than 180 days prior to the expiration date.

Alan Keller, P.E.
Manager, Permit Section
Division of Water Pollution Control

SAK:JAR:15042301

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Modification Date:

NPDES Permit No. IL0002259

Effluent Limitations and Monitoring

From the modification date of this permit until the expiration date, the effluent of the following discharge(s) shall be monitored and limited at all times as follows:

PARAMETER	LOAD LIMITS lbs/day DAF (DMF) 30 DAY AVERAGE	LOAD LIMITS lbs/day DAF (DMF) DAILY MAXIMUM	CONCENTRATION LIMITS mg/l 30 DAY AVERAGE	CONCENTRATION LIMITS mg/l DAILY MAXIMUM	SAMPLE FREQUENCY	SAMPLE TYPE

Outfall 001: Condenser Cooling Water and House Service Water (DAF = 739 MGD)

This discharge consists of:

1.	Condenser cooling water	589 MGD
2.	House service water	29.7 MGD
3.	Boiler blowdown	Intermittent
4.	Reverse osmosis wastes	0.06 MGD
5.	Wastewater treatment system effluent	8.13 MGD
6.	East yard runoff basin overflow/discharge	0.676 MGD
7.	Demineralized water (storage tank drainage and steam relief)	Intermittent
8.	Intake screen backwash	0.172 MGD

Flow (MGD)	See Special Condition 1		Daily	Continuous
pH	See Special Condition 2		Weekly	Grab
Total Residual Chlorine	See Special Condition 3	0.05	*	Grab
Temperature	See Special Condition 4		Daily	Continuous
Heat Rejection Rate		5301 million BTU's per hour	Daily	Continuous

The monthly maximum temperature and the monthly maximum BTU's per hour shall be reported on the DMR under temperature and heat rejection rate, respectively.

*Total Residual Chlorine shall be sampled whenever chlorination or biocide addition is being performed or residuals are likely to be present in the discharge. If chlorination and biocide addition are not used during the month it shall be so indicated on the DMR.

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PUBLIC NOTICE

Effluent Limitations and Monitoring

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PARAMETER	LOAD LIMITS lbs/day DAF (DMF) 30 DAY AVERAGE	LOAD LIMITS lbs/day DAF (DMF) DAILY MAXIMUM	CONCENTRATION LIMITS mg/l 30 DAY AVERAGE	CONCENTRATION LIMITS mg/l DAILY MAXIMUM	SAMPLE FREQUENCY	SAMPLE TYPE
Outfall A01: Boiler Blowdown (Intermittent Discharge)						
The discharge consists of:				Approximate Flow		
1. Boiler blowdown				0.018 MGD		
2. Boiler drains				0.018 MGD		
Flow (MGD)	See Special Condition 1				2/Month When Discharging	Calculated 24-Hour Total
Total Suspended Solids			15	30	2/Month When Discharging	8-Hour Composite
Oil and Grease			15	20	2/Month When Discharging	Grab

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PARAMETER	LOAD LIMITS lbs/day DAF (DMF) 30 DAY AVERAGE	LOAD LIMITS lbs/day DAF (DMF) DAILY MAXIMUM	CONCENTRATION LIMITS mg/l 30 DAY AVERAGE	CONCENTRATION LIMITS mg/l DAILY MAXIMUM	SAMPLE FREQUENCY	SAMPLE TYPE
Outfall B01: Reverse Osmosis Wastes (DAF = 0.06 MGD)						
The discharge consists of:				Approximate Flow		
1. Reverse Osmosis Reject				65 gpm		
2. Reverse Osmosis Regeneration				450 gallons/cleaning		
Flow (MGD)	See Special Condition 1				2/Month	24-Hour Total
Total Suspended Solids			15	30	2/Month	8-Hour Composite
Oil and Grease			15	20	2/Month	Grab

Total Suspended Solids and Oil and Grease sampling may obtained using a Grab Sample if the equalization tank is in service.

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PUBLIC NOTICE

Effluent Limitations and Monitoring

From the modification date of this permit until the expiration date, the effluent of the following discharge(s) shall be monitored and limited at all times as follows:

PARAMETER	LOAD LIMITS lbs/day DAF (DMF) 30 DAY AVERAGE	LOAD LIMITS lbs/day DAF (DMF) DAILY MAXIMUM	CONCENTRATION LIMITS mg/l 30 DAY AVERAGE	CONCENTRATION LIMITS mg/l DAILY MAXIMUM	SAMPLE FREQUENCY	SAMPLE TYPE
Outfall C01: Wastewater Treatment System (DAF = 8.13 MGD)						
This Discharge consists of:				Approximate Flow		
1. Bottom Ash Sluice				1.6 MGD		
2. Ash hopper overflow				Intermittent		
3. Coal pile runoff collection basin discharge				1.0 MGD		
a. Coal pile area runoff				0.5 MGD		
b. West yard area runoff				0.5 MGD		
i. West yard area runoff						
ii. Car dumper area runoff						
iii. Main switch yard area runoff						
iv. West yard polymer building drains						
v. Peaker sump discharges						
vi. West turbine area roof drains						
4. Non-chemical metal cleaning waste				Intermittent		
5. Supernatant from dredge spoil lagoons				Intermittent		
6. Main collection tank discharge				2.0 MGD		
a. Unit 8 low point sump (roof, floor, & equipment drains)				Intermittent		
b. Ash sluice head tank overflow				Intermittent		
c. Slag drain line				Intermittent		
d. Slag tank overflows				Intermittent		
e. RO filter backwash (alternate route)				Intermittent		
f. Floor drains (alternate route)				Intermittent		
Flow (MGD)	See Special Condition 1				Daily	Continuous
Total Suspended Solids			15	30	2/Month	24-Hour Composite
Oil and Grease			15	20	2/Month	Grab

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NPDES Permit No. IL0002259

Effluent Limitations and Monitoring

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PARAMETER	LOAD LIMITS lbs/day DAF (DMF) 30 DAY AVERAGE	LOAD LIMITS lbs/day DAF (DMF) DAILY MAXIMUM	CONCENTRATION LIMITS mg/l 30 DAY AVERAGE	CONCENTRATION LIMITS mg/l DAILY MAXIMUM	SAMPLE FREQUENCY	SAMPLE TYPE
Outfall D01: East Yard Collection Basin Overflow (DAF = 0.676 MGD)						
This discharge consists of:				Approximate Flow		
1. East yard area runoff				Intermittent		
2. Units 1-4 roof and floor drainage				Intermittent		
3. East yard polymer building drains				Intermittent		
4. RO filter backwash				0.078 MGD		
5. Laboratory sink drains				Intermittent		
6. Units 5-8 roof and floor drains				Intermittent		
7. Trona Mill Wash				800 gpd		
Flow (MGD)	See Special Condition 1				1/Week	24-Hour Total
Total Suspended Solids			15	30	2/Month	24-Hour Composite
Oil and Grease			15	20	2/Month	Grab

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PUBLIC NOTICE

Effluent Limitations and Monitoring

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PARAMETER	LOAD LIMITS lbs/day DAF (DMF) 30 DAY AVERAGE	LOAD LIMITS lbs/day DAF (DMF) DAILY MAXIMUM	CONCENTRATION LIMITS mg/l 30 DAY AVERAGE	CONCENTRATION LIMITS mg/l DAILY MAXIMUM	SAMPLE FREQUENCY	SAMPLE TYPE
Outfall F01: Unit 7 Demineralized Water Storage Tank Drain(Intermittent Discharge)						
Flow (MGD)	See Special Condition 1				1/Week When Discharging	Estimate
Total Suspended Solids			15	30	1/Week When Discharging	Grab
Oil and Grease			15	20	1/Week When Discharging	Grab

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Effluent Limitations and Monitoring

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PARAMETER	LOAD LIMITS lbs/day DAF (DMF) 30 DAY AVERAGE	LOAD LIMITS lbs/day DAF (DMF) DAILY MAXIMUM	CONCENTRATION LIMITS mg/l 30 DAY AVERAGE	CONCENTRATION LIMITS mg/l DAILY MAXIMUM	SAMPLE FREQUENCY	SAMPLE TYPE
Outfall G01: Non-Chemical Metal Cleaning Wastes (DAF = Intermittent Discharge)						
Flow (MGD)	See Special Condition 1				Daily When Discharging	Continuous
Total Suspended Solids			30	100	Daily When Discharging	24-Hour Composite
Oil and Grease			15	20	Daily When Discharging	Grab
Iron			1.0	1.0	Daily When Discharging	24-Hour Composite
Copper			1.0	1.0	Daily When Discharging	24-Hour Composite

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PUBLIC NOTICE

Special Conditions

SPECIAL CONDITION 1. Flow shall be measured in units of Million Gallons per Day (MGD) and reported as a monthly average and a daily maximum value on the monthly Discharge Monitoring Report.

SPECIAL CONDITION 2. The pH shall be in the range 7.0 to 9.0. The monthly minimum and monthly maximum values shall be reported on the DMR form.

The permittee shall achieve compliance with the above pH limitation at outfall 001 as soon as possible but not later than 18 months from the effective date of this permit in accordance with the following schedule:

	ITEM	COMPLETION DATE
1.	Initial Report	6 Months from the Effective Date
2.	Interim Report	12 Months from the Effective Date
3.	Final Report and Compliance	18 Months from the Effective Date

From the effective date of the permit, pH shall be monitored at outfall 001 weekly as specified on page 2 of the permit. The initial report shall include a summary of this data and a determination of whether or not additional treatment is necessary to achieve and maintain compliance with the applicable pH limit. If additional treatment is determined not to be necessary, compliance with the applicable pH limit is required 6 months from the effective date of this permit. All reports shall be submitted to the IEPA at the address in special condition 6.

SPECIAL CONDITION 3. All samples for total residual chlorine (TRC) shall be analyzed by an applicable method contained in 40 CFR 136, equivalent in accuracy to low-level amperometric titration. Any analytical variability of the method used shall be considered when determining the accuracy and precision of the results obtained.

SPECIAL CONDITION 4. Pursuant to Illinois Pollution Control Board Order 77-82, dated August 3, 1978 the discharge is limited to a heat rejection rate of 5301 million BTU's per hour in lieu of the standards of 35 Ill. Adm. Code 302.507. The Permittee's demonstration for the Waukegan Generating Station in accordance with Section 316(a) of the CWA was approved by the Illinois Pollution Control Board in Order PCB 78-72, -73 Consolidated dated September 21, 1978.

Compliance with this part shall be determined on a continuous basis by the following equation:

$$H = 0.0005 Q_{CW} (T_{CW} - T_{US})$$

H Heat Rejection Rate in million BTU's per hour.

T_{CW} Actual condenser cooling water discharge temperature in degrees Fahrenheit from continuous temperature monitor located at the condenser outlet waterbox.

Q_{CW} Condenser cooling water flow in gallons per minute based on the number of circulating water pumps on at the time in question. Each of Unit 7's four circulating water pumps is rated at 64,000 gpm and each of Unit 8's two circulating water pumps is rated at 110,000 gpm.

T_{US} Intake cooling water temperature in degrees Fahrenheit from the continuous temperature monitor located at the condenser inlet waterbox.

As a condition of the continuation of the facility's 316(a) thermal variance (PCB 72-73 Consolidated, dated September 21, 1978), the permittee shall conduct the following activities and studies:

1. Within six months of the permit issuance date:

   a. Complete a literature search for biological studies conducted in Lake Michigan in the general vicinity of the facility, including but not limited to, relevant biological monitoring data from state or federal agencies.
   b. Prepare a Representative Important Species (RIS) List, including an explanation of the rationale for selection of each species on the list; and
   c. Based on the results of the biological studies literature search and the RIS List, prepare a study plan for biological sampling and thermal monitoring, including as appropriate thermal modeling. The study plan shall be submitted to the Agency for approval prior to initiation. The study plan shall include the RIS List. The permittee shall also send a copy of the study plan and RIS List to the U.S. EPA Region 5 to provide it with an opportunity to review and comment on the study plan prior to commencement of the study.

2. Upon the Agency's approval of the study plan for biological and thermal monitoring, perform thermal plume surveys on the facility's discharge and any appropriate thermal model development and field verification within eighteen months of the receipt of the Agency's approval. In the event that the Agency's approval of the study plan is not received within nine months of the permit issuance date, the permittee may proceed to implement the study plan pending receipt of the Agency's approval.

3. Based on the information obtained from thermal plume surveys, the permittee shall finalize the specific sampling locations for,

and conduct, the biological monitoring study plan.

If the permittee intends to request the continuation of the 316(a) thermal variance in its renewed NPDES permit, the permittee shall submit to the Agency a report containing the results of the biological and thermal monitoring, including any applicable thermal modeling, and any other information necessary to comply with 35 Ill. Adm. Code 106.1180 concurrent with its next NPDES permit renewal application.

Alternately, the Permittee may demonstrate to the Agency that alternate thermal standards of PCB 77-82, or other site specific water quality standards for temperature approved by the Illinois Pollution Control Board, and USEPA, meets the requirements of 40 CFR 131 and the Illinois Environmental Protection Act.

SPECIAL CONDITION 5. Samples taken in compliance with the effluent monitoring requirements shall be taken at a point representative of the discharge, but prior to entry into the receiving stream.

SPECIAL CONDITION 6. The Permittee shall record monitoring results on Discharge Monitoring Report (DMR) Forms using one such form for each outfall each month.

In the event that an outfall does not discharge during a monthly reporting period, the DMR Form shall be submitted with no discharge indicated.

The Permittee will be required to submit electronic DMRs (NetDMRs) instead of mailing paper DMRs to the IEPA beginning December 21, 2016 unless a waiver has been granted by the Agency. More information, including registration information for the NetDMR program, can be obtained on the IEPA website, http://www.epa.state.il.us/water/net-dmr/index.html.

The completed Discharge Monitoring Report forms shall be submitted to IEPA no later than the 28th day of the following month, unless otherwise specified by the permitting authority.

Permittees that have been granted a waiver shall mail Discharge Monitoring Reports with an original signature to the IEPA at the following address:

Illinois Environmental Protection Agency
Division of Water Pollution Control
Attention: Compliance Assurance Section, Mail Code # 19
1021 North Grand Avenue East
Post Office Box 19276
Springfield, Illinois 62794-9276

SPECIAL CONDITION 7. Cooling Water Intake Structure. Based on available information, the Agency has determined that the operation of the cooling water intake structure meets the equivalent of Best Technology Available (BTA) in accordance with the Best Professional Judgment provisions of 40 CFR 125.3 and 40 CFR 125.90(b), based on information available at the time of permit reissuance.

However, the Permittee shall comply with the requirements of the Cooling Water Intake Structure Existing Facilities Rule as found at 40 CFR 122 and 125. Any application materials and submissions required for compliance with the Existing Facilities Rule, shall be submitted to the Agency no later than 4 years from the effective date of this permit.

If for any reason, the Cooling Water Intake Structure Existing Facilities Rule is stayed or remanded by the courts, the Permittee shall comply with the requirements below. The information required below is necessary to further evaluate cooling water intake structure operations based on the most up to date information, in accordance with the Best Professional Judgment provisions of 40 CFR 125.3 and 40 CFR 125.90(b), in existence prior to the effective date of the new Existing Facilities Rule:

A. The permittee shall submit the following information/studies within 4 years of the effective date of the permit:

1. Source Water Physical Data to include:

   a. A narrative description and scaled drawings showing the physical configuration of all source water bodies used by the facility including aerial dimensions, depths, salinity and temperature regimes;

   b. Identification and characterization of the source waterbody's hydrological and geomorphological features, as well as the methods used to conduct any physical studies to determine the intake's area of influence and the results of such studies; and

   c. Location maps.

2. Source Waterbody Flow Information

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The permittee shall provide the annual mean flow of the waterbody, any supporting documentation and engineering calculations to support the analysis of whether the design intake flow is greater than five percent of the mean annual flow of the river or stream for purposes of determining applicable performance standards. Representative historical data (from a period of time up to 10 years) shall be used, if available.

3. Impingement Mortality and Entrainment Characterization Study

   The permittee shall submit an Impingement Mortality and Entrainment Characterization Study whose purpose is to provide information to support the development of a calculation baseline for evaluating impingement mortality and entrainment and to characterize current impingement mortality and entrainment. The Study shall include the following in sufficient detail to support establishment of baseline conditions:

   a. Taxonomic identification of all life stages of fish and shellfish and any species protected under Federal, State, or Tribal law (including threatened or endangered species) that are in the vicinity of the cooling water intake structure(s) and are susceptible to impingement and entrainment;

   b. A characterization of all life stages of fish and shellfish, and any species protected under Federal, or State law, including a description of the abundance and temporal and spatial characteristics in the vicinity of the cooling water intake structure(s). These may include historical data that are representative of the current operation of the facility and of biological conditions at the site; and

   c. Documentation of the current impingement mortality and entrainment of all life stages of fish, shellfish, and any species protected under Federal , State, or Tribal Law (including threatened or endangered species) and an estimate of impingement mortality and entrainment to be used as the calculation baseline. The documentation may include historical data that are representative of the current operation of the facility and of biological conditions at the site. Impingement mortality and entrainment samples to support the calculations required must be collected during periods of representative operational flows for the cooling water intake structure and the flows associated with the samples must be documented.

B. The permittee shall comply with the following requirements:

   1. At all times properly operate and maintain the intake equipment as demonstrated in the application material supporting the BTA determination.

   2. Inform IEPA of any proposed changes to the cooling water intake structure or proposed changes to operations at the facility that affect impingement mortality and/or entrainment.

   3. Debris collected on intake screens is prohibited from being discharged back to the canal. Debris does not include living fish or other living aquatic organisms.

   4. Compliance Alternatives. The permittee must evaluate each of the following alternatives for establishing best available technology for minimizing adverse environmental impacts at the facility due to operation of the intake structure:

      a. Evaluate operational procedures and/or propose facility modifications to reduce the intake through-screen velocity to less than 0.5 ft/sec. The operational evaluation may consider modified circulating water pump operation; reduced flow associated with capacity utilization, recalculation or determination of actual total water withdrawal capacity. The evaluation report and any implementation plan for the operational changes and/ or facility modification shall be submitted to the Agency with the renewal application for this permit.

      b. Complete a fish impingement and entrainment mortality minimization alternatives evaluation. The evaluation may include an assessment of modification of the traveling screens, consideration of a separate fish and debris return system and include time frames and cost analysis to implement these measures. The evaluation report and implementation plan for any operational changes and/ or facility modifications shall be submitted to the Agency with the renewal application for this permit.

C. All required reports shall be submitted to the Industrial Unit, Permit Section and Compliance Assurance Section at the address in special condition 6.

This special condition does not relieve the permittee of the responsibility of complying with any other laws, regulations, or judicial orders issued pursuant to Section 316(b) of the Clean Water Act.

SPECIAL CONDITION 8. If an applicable effluent standard or limitation is promulgated under Sections 301(b)(2)(C) and (D), 304(b)(2), and 307(a)(2) of the Clean Water Act and that effluent standard or limitation is more stringent than any effluent limitation in the permit or

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controls a pollutant not limited in the NPDES Permit, the Agency shall revise or modify the permit in accordance with the more stringent standard or prohibition and shall so notify the permittee.

SPECIAL CONDITION 9. The use or operation of this facility shall be by or under the supervision of a Certified Class K operator.

SPECIAL CONDITION 10. In the event that the permittee shall require changes in the use of water treatment additives, the permittee must request a change in this permit in accordance with the Standard Conditions -- Attachment H.

SPECIAL CONDITION 11. The cooling water prior to entering the intake structure and at outfall 001 shall be sampled once per week as a grab sample at the same time of day within ½ hour of each other between 9:00 a.m. and 3:00 p.m. in a random fashion for dissolved oxygen. The results in mg/l and the time of day the influent and effluent sample was taken shall be reported to the Agency as an attachment to the DMR. After 2 years of data has been submitted to the Agency, the permittee may apply to Agency to have the monitoring reduced or eliminated.

SPECIAL CONDITION 12. There shall be no discharge of polychlorinated biphenyl compounds.

SPECIAL CONDITION 13. The bypass provisions of 40 CFR 122.41(m) and upset provisions of 40 CFR 122.41(n) are hereby incorporated by reference.

SPECIAL CONDITION 14. The Agency has determined that the effluent limitations for outfall 001 constitute BAT/BCT for storm water which is treated in the existing treatment facilities for purposes of this permit reissuance, and no pollution prevention plan will be required for such storm water. In addition to the chemical specific monitoring required elsewhere in this permit, the permittee shall conduct an annual inspection of the facility site to identify areas contributing to a storm water discharge associated with industrial activity, and determine whether any facility modifications have occurred which result in previously-treated storm water discharges no longer receiving treatment. If any such discharges are identified the permittee shall request a modification of this permit within 30 days after the inspection. Records of the annual inspection shall be retained by the permittee for the term of this permit and be made available to the Agency on request.

SPECIAL CONDITION 15. There shall be no discharge of complexed metal bearing wastestreams and associated rinses from chemical metal cleaning unless this permit has been modified to include the new discharge.

SPECIAL CONDITION 16. The Permittee shall monitor the effluent from outfall 001 for the following parameters on a semi-annual basis. This Permit may be modified with public notice to establish effluent limitations if appropriate, based on information obtained through sampling. The sample shall be a 24-hour effluent composite except as otherwise specifically provided below and the results shall be submitted to the address in special condition 6 in June and December. The parameters to be sampled and the minimum reporting limits to be attained are as follows:

STORET CODE	PARAMETER	Minimum reporting limit
01002	Arsenic	0.05 mg/L
01007	Barium	0.5 mg/L
01022	Boron	0.1 mg/L
01027	Cadmium	0.001 mg/L
00940	Chloride	1.0 mg/L
01032	Chromium (hexavalent) (grab)	0.01 mg/L
01034	Chromium (total)	0.05 mg/L
01042	Copper	0.005 mg/L
00718	Cyanide (grab) (available *** or amendable to chlorination))	5.0 ug/L
00720	Cyanide (grab not to exceed 24 hours) (total)	5.0 ug/L
00951	Fluoride	0.1 mg/L
01045	Iron (total)	0.5 mg/L
01046	Iron (Dissolved)	0.5 mg/L
01051	Lead	0.05 mg/L
01055	Manganese	0.5 mg/L
71900	Mercury (grab)**	1.0 ng/L*
01067	Nickel	0.005 mg/L
00556	Oil (hexane soluble or equivalent) (Grab Sample only)	5.0 mg/L
32730	Phenols (grab)	0.005 mg/L
01147	Selenium	0.005 mg/L
00945	Sulfate	10 mg/L
01077	Silver (total)	0.003 mg/L
01092	Zinc	0.025 mg/L

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PUBLIC NOTICE

Special Conditions

Unless otherwise indicated, concentrations refer to the total amount of the constituent present in all phases, whether solid, suspended or dissolved, elemental or combined, including all oxidation states.

*1.0 ng/L = 1 part per trillion.
**Utilize USEPA Method 1631E and the digestion procedure described in Section 11.1.1.2 of 1631E. Mercury shall be monitored monthly for the first two years and quarterly thereafter. This Permit may be modified with public notice to establish effluent limitations if appropriate, based on information obtained through sampling. The quarterly monitoring results shall be submitted on the March, June, September and December DMRs.
***USEPA Method OIA-1677

SPECIAL CONDITION 17. The effluent, alone or in combination with other sources, shall not cause a violation of any applicable water quality standard outlined in 35 Ill. Adm. Code 302.

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Standard Conditions

Definitions

Act means the Illinois Environmental Protection Act, 415 ILCS 5 as Amended.

Agency means the Illinois Environmental Protection Agency.

Board means the Illinois Pollution Control Board.

Clean Water Act (formerly referred to as the Federal Water Pollution Control Act) means Pub. L 92-500, as amended. 33 U.S.C. 1251 et seq.

NPDES (National Pollutant Discharge Elimination System) means the national program for issuing, modifying, revoking and reissuing, terminating, monitoring and enforcing permits, and imposing and enforcing pretreatment requirements, under Sections 307, 402, 318 and 405 of the Clean Water Act.

USEPA means the United States Environmental Protection Agency.

Daily Discharge means the discharge of a pollutant measured during a calendar day or any 24-hour period that reasonably represents the calendar day for purposes of sampling. For pollutants with limitations expressed in units of mass, the "daily discharge" is calculated as the total mass of the pollutant discharged over the day. For pollutants with limitations expressed in other units of measurements, the "daily discharge" is calculated as the average measurement of the pollutant over the day.

Maximum Daily Discharge Limitation (daily maximum) means the highest allowable daily discharge.

Average Monthly Discharge Limitation (30 day average) means the highest allowable average of daily discharges over a calendar month, calculated as the sum of all daily discharges measured during a calendar month divided by the number of daily discharges measured during that month.

Average Weekly Discharge Limitation (7 day average) means the highest allowable average of daily discharges over a calendar week, calculated as the sum of all daily discharges measured during a calendar week divided by the number of daily discharges measured during that week.

Best Management Practices (BMPs) means schedules of activities, prohibitions of practices, maintenance procedures, and other management practices to prevent or reduce the pollution of waters of the State. BMPs also include treatment requirements, operating procedures, and practices to control plant site runoff, spillage or leaks, sludge or waste disposal, or drainage from raw material storage.

Aliquot means a sample of specified volume used to make up a total composite sample.

Grab Sample means an individual sample of at least 100 milliliters collected at a randomly-selected time over a period not exceeding 15 minutes.

24-Hour Composite Sample means a combination of at least 8 sample aliquots of at least 100 milliliters, collected at periodic intervals during the operating hours of a facility over a 24-hour period.

8-Hour Composite Sample means a combination of at least 3 sample aliquots of at least 100 milliliters, collected at periodic intervals during the operating hours of a facility over an 8-hour period.

Flow Proportional Composite Sample means a combination of sample aliquots of at least 100 milliliters collected at periodic intervals such that either the time interval between each aliquot or the volume of each aliquot is proportional to either the stream flow at the time of sampling or the total stream flow since the collection of the previous aliquot.

(1) **Duty to comply**. The permittee must comply with all conditions of this permit. Any permit noncompliance constitutes a violation of the Act and is grounds for enforcement action, permit termination, revocation and reissuance, modification, or for denial of a permit renewal application. The permittee shall comply with effluent standards or prohibitions established under Section 307(a) of the Clean Water Act for toxic pollutants within the time provided in the regulations that establish these standards or prohibitions, even if the permit has not yet been modified to incorporate the requirements.

(2) **Duty to reapply**. If the permittee wishes to continue an activity regulated by this permit after the expiration date of this permit, the permittee must apply for and obtain a new permit. If the permittee submits a proper application as required by the Agency no later than 180 days prior to the expiration date, this permit shall continue in full force and effect until the final Agency decision on the application has been made.

(3) **Need to halt or reduce activity not a defense**. It shall not be a defense for a permittee in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this permit.

(4) **Duty to mitigate**. The permittee shall take all reasonable steps to minimize or prevent any discharge in violation of this permit which has a reasonable likelihood of adversely affecting human health or the environment.

(5) **Proper operation and maintenance**. The permittee shall at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) which are installed or used by the permittee to achieve compliance with conditions of this permit. Proper operation and maintenance includes effective performance, adequate funding, adequate operator staffing and training, and adequate laboratory and process controls, including appropriate quality assurance procedures. This provision requires the operation of back-up, or auxiliary facilities, or similar systems only when necessary to achieve compliance with the conditions of the permit.

(6) **Permit actions**. This permit may be modified, revoked and reissued, or terminated for cause by the Agency pursuant to 40 CFR 122.62 and 40 CFR 122.63. The filing of a request by the permittee for a permit modification, revocation and reissuance, or termination, or a notification of planned changes or anticipated noncompliance, does not stay any permit condition.

(7) **Property rights**. This permit does not convey any property rights of any sort, or any exclusive privilege.

(8) **Duty to provide information**. The permittee shall furnish to the Agency within a reasonable time, any information which the Agency may request to determine whether cause exists for modifying, revoking and reissuing, or terminating this permit, or to determine compliance with the permit. The permittee shall also furnish to the Agency upon request, copies of records required to be kept by this permit.

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(9) **Inspection and entry**. The permittee shall allow an authorized representative of the Agency or USEPA (including an authorized contractor acting as a representative of the Agency or USEPA), upon the presentation of credentials and other documents as may be required by law, to:
   (a) Enter upon the permittee's premises where a regulated facility or activity is located or conducted, or where records must be kept under the conditions of this permit;
   (b) Have access to and copy, at reasonable times, any records that must be kept under the conditions of this permit;
   (c) Inspect at reasonable times any facilities, equipment (including monitoring and control equipment), practices, or operations regulated or required under this permit; and
   (d) Sample or monitor at reasonable times, for the purpose of assuring permit compliance, or as otherwise authorized by the Act, any substances or parameters at any location.

(10) **Monitoring and records**.
   (a) Samples and measurements taken for the purpose of monitoring shall be representative of the monitored activity.
   (b) The permittee shall retain records of all monitoring information, including all calibration and maintenance records, and all original strip chart recordings for continuous monitoring instrumentation, copies of all reports required by this permit, and records of all data used to complete the application for this permit, for a period of at least 3 years from the date of this permit, measurement, report or application. Records related to the permittee's sewage sludge use and disposal activities shall be retained for a period of at least five years (or longer as required by 40 CFR Part 503). This period may be extended by request of the Agency or USEPA at any time.
   (c) Records of monitoring information shall include:
      (1) The date, exact place, and time of sampling or measurements;
      (2) The individual(s) who performed the sampling or measurements;
      (3) The date(s) analyses were performed;
      (4) The individual(s) who performed the analyses;
      (5) The analytical techniques or methods used; and
      (6) The results of such analyses.
   (d) Monitoring must be conducted according to test procedures approved under 40 CFR Part 136, unless other test procedures have been specified in this permit. Where no test procedure under 40 CFR Part 136 has been approved, the permittee must submit to the Agency a test method for approval. The permittee shall calibrate and perform maintenance procedures on all monitoring and analytical instrumentation at intervals to ensure accuracy of measurements.

(11) **Signatory requirement**. All applications, reports or information submitted to the Agency shall be signed and certified.
   (a) **Application**. All permit applications shall be signed as follows:
      (1) For a corporation: by a principal executive officer of at least the level of vice president or a person or position having overall responsibility for environmental matters for the corporation:
      (2) For a partnership or sole proprietorship: by a general partner or the proprietor, respectively; or
      (3) For a municipality, State, Federal, or other public agency: by either a principal executive officer or ranking elected official.
   (b) **Reports**. All reports required by permits, or other information requested by the Agency shall be signed by a person described in paragraph (a) or by a duly authorized representative of that person. A person is a duly authorized representative only if:
      (1) The authorization is made in writing by a person described in paragraph (a); and
      (2) The authorization specifies either an individual or a position responsible for the overall operation of the facility, from which the discharge originates, such as a plant manager, superintendent or person of equivalent responsibility; and
      (3) The written authorization is submitted to the Agency.
   (c) **Changes of Authorization**. If an authorization under (b) is no longer accurate because a different individual or position has responsibility for the overall operation of the facility, a new authorization satisfying the requirements of (b) must be submitted to the Agency prior to or together with any reports, information, or applications to be signed by an authorized representative.
   (d) **Certification**. Any person signing a document under paragraph (a) or (b) of this section shall make the following certification:

      I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

(12) **Reporting requirements**.
   (a) **Planned changes**. The permittee shall give notice to the Agency as soon as possible of any planned physical alterations or additions to the permitted facility. Notice is required when:
      (1) The alteration or addition to a permitted facility may meet one of the criteria for determining whether a facility is a new source pursuant to 40 CFR 122.29 (b); or
      (2) The alteration or addition could significantly change the nature or increase the quantity of pollutants discharged. This notification applies to pollutants which are subject neither to effluent limitations in the permit, nor to notification requirements pursuant to 40 CFR 122.42 (a)(1).
      (3) The alteration or addition results in a significant change in the permittee's sludge use or disposal practices, and such alteration, addition, or change may justify the application of permit conditions that are different from or absent in the existing permit, including notification of additional use or disposal sites not reported during the permit application process or not reported pursuant to an approved land application plan.
   (b) **Anticipated noncompliance**. The permittee shall give advance notice to the Agency of any planned changes in the permitted facility or activity which may result in noncompliance with permit requirements.
   (c) **Transfers**. This permit is not transferable to any person except after notice to the Agency.
   (d) **Compliance schedules**. Reports of compliance or noncompliance with, or any progress reports on, interim and final requirements contained in any compliance schedule of this permit shall be submitted no later than 14 days following each schedule date.
   (e) **Monitoring reports**. Monitoring results shall be reported at the intervals specified elsewhere in this permit.
      (1) Monitoring results must be reported on a Discharge Monitoring Report (DMR).

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(2) If the permittee monitors any pollutant more frequently than required by the permit, using test procedures approved under 40 CFR 136 or as specified in the permit, the results of this monitoring shall be included in the calculation and reporting of the data submitted in the DMR.

(3) Calculations for all limitations which require averaging of measurements shall utilize an arithmetic mean unless otherwise specified by the Agency in the permit.

(f) **Twenty-four hour reporting.** The permittee shall report any noncompliance which may endanger health or the environment. Any information shall be provided orally within 24-hours from the time the permittee becomes aware of the circumstances. A written submission shall also be provided within 5 days of the time the permittee becomes aware of the circumstances. The written submission shall contain a description of the noncompliance and its cause; the period of noncompliance, including exact dates and time; and if the noncompliance has not been corrected, the anticipated time it is expected to continue; and steps taken or planned to reduce, eliminate, and prevent reoccurrence of the noncompliance. The following shall be included as information which must be reported within 24-hours:

(1) Any unanticipated bypass which exceeds any effluent limitation in the permit.

(2) Any upset which exceeds any effluent limitation in the permit.

(3) Violation of a maximum daily discharge limitation for any of the pollutants listed by the Agency in the permit or any pollutant which may endanger health or the environment.

The Agency may waive the written report on a case-by-case basis if the oral report has been received within 24-hours.

(g) **Other noncompliance.** The permittee shall report all instances of noncompliance not reported under paragraphs (12) (d), (e), or (f), at the time monitoring reports are submitted. The reports shall contain the information listed in paragraph (12) (f).

(h) **Other Information.** Where the permittee becomes aware that it failed to submit any relevant facts in a permit application, or submitted incorrect information in a permit application, or in any report to the Agency, it shall promptly submit such facts or information.

(13) **Bypass.**

(a) Definitions.

(1) Bypass means the intentional diversion of waste streams from any portion of a treatment facility.

(2) Severe property damage means substantial physical damage to property, damage to the treatment facilities which causes them to become inoperable, or substantial and permanent loss of natural resources which can reasonably be expected to occur in the absence of a bypass. Severe property damage does not mean economic loss caused by delays in production.

(b) Bypass not exceeding limitations. The permittee may allow any bypass to occur which does not cause effluent limitations to be exceeded, but only if it also is for essential maintenance to assure efficient operation. These bypasses are not subject to the provisions of paragraphs (13)(c) and (13)(d).

(c) Notice.

(1) Anticipated bypass. If the permittee knows in advance of the need for a bypass, it shall submit prior notice, if possible at least ten days before the date of the bypass.

(2) Unanticipated bypass. The permittee shall submit notice of an unanticipated bypass as required in paragraph (12)(f) (24-hour notice).

(d) Prohibition of bypass.

(1) Bypass is prohibited, and the Agency may take enforcement action against a permittee for bypass, unless:

(i) Bypass was unavoidable to prevent loss of life, personal injury, or severe property damage;

(ii) There were no feasible alternatives to the bypass, such as the use of auxiliary treatment facilities, retention of untreated wastes, or maintenance during normal periods of equipment downtime. This condition is not satisfied if adequate back-up equipment should have been installed in the exercise of reasonable engineering judgment to prevent a bypass which occurred during normal periods of equipment downtime or preventive maintenance; and

(iii) The permittee submitted notices as required under paragraph (13)(c).

(2) The Agency may approve an anticipated bypass, after considering its adverse effects, if the Agency determines that it will meet the three conditions listed above in paragraph (13)(d)(1).

(14) **Upset.**

(a) Definition. Upset means an exceptional incident in which there is unintentional and temporary noncompliance with technology based permit effluent limitations because of factors beyond the reasonable control of the permittee. An upset does not include noncompliance to the extent caused by operational error, improperly designed treatment facilities, inadequate treatment facilities, lack of preventive maintenance, or careless or improper operation.

(b) Effect of an upset. An upset constitutes an affirmative defense to an action brought for noncompliance with such technology based permit effluent limitations if the requirements of paragraph (14)(c) are met. No determination made during administrative review of claims that noncompliance was caused by upset, and before an action for noncompliance, is final administrative action subject to judicial review.

(c) Conditions necessary for a demonstration of upset. A permittee who wishes to establish the affirmative defense of upset shall demonstrate, through properly signed, contemporaneous operating logs, or other relevant evidence that:

(1) An upset occurred and that the permittee can identify the cause(s) of the upset;

(2) The permitted facility was at the time being properly operated; and

(3) The permittee submitted notice of the upset as required in paragraph (12)(f)(2) (24-hour notice).

(4) The permittee complied with any remedial measures required under paragraph (4).

(d) Burden of proof. In any enforcement proceeding the permittee seeking to establish the occurrence of an upset has the burden of proof.

(15) **Transfer of permits.** Permits may be transferred by modification or automatic transfer as described below:

(a) Transfers by modification. Except as provided in paragraph (b), a permit may be transferred by the permittee to a new owner or operator only if the permit has been modified or revoked and reissued pursuant to 40 CFR 122.62 (b) (2), or a minor modification made pursuant to 40 CFR 122.63 (d), to identify the new permittee and incorporate such other requirements as may be necessary under the Clean Water Act.

(b) Automatic transfers. As an alternative to transfers under paragraph (a), any NPDES permit may be automatically transferred to a new permittee if:

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(1) The current permittee notifies the Agency at least 30 days in advance of the proposed transfer date;
(2) The notice includes a written agreement between the existing and new permittees containing a specified date for transfer of permit responsibility, coverage and liability between the existing and new permittees; and
(3) The Agency does not notify the existing permittee and the proposed new permittee of its intent to modify or revoke and reissue the permit. If this notice is not received, the transfer is effective on the date specified in the agreement.

(16) All manufacturing, commercial, mining, and silvicultural dischargers must notify the Agency as soon as they know or have reason to believe:
(a) That any activity has occurred or will occur which would result in the discharge of any toxic pollutant identified under Section 307 of the Clean Water Act which is not limited in the permit, if that discharge will exceed the highest of the following notification levels:
(1) One hundred micrograms per liter (100 ug/l);
(2) Two hundred micrograms per liter (200 ug/l) for acrolein and acrylonitrile; five hundred micrograms per liter (500 ug/l) for 2,4-dinitrophenol and for 2-methyl-4,6 dinitrophenol; and one milligram per liter (1 mg/l) for antimony.
(3) Five (5) times the maximum concentration value reported for that pollutant in the NPDES permit application; or
(4) The level established by the Agency in this permit.
(b) That they have begun or expect to begin to use or manufacture as an intermediate or final product or byproduct any toxic pollutant which was not reported in the NPDES permit application.

(17) All Publicly Owned Treatment Works (POTWs) must provide adequate notice to the Agency of the following:
(a) Any new introduction of pollutants into that POTW from an indirect discharge which would be subject to Sections 301 or 306 of the Clean Water Act if it were directly discharging those pollutants; and
(b) Any substantial change in the volume or character of pollutants being introduced into that POTW by a source introducing pollutants into the POTW at the time of issuance of the permit.
(c) For purposes of this paragraph, adequate notice shall include information on (i) the quality and quantity of effluent introduced into the POTW, and (ii) any anticipated impact of the change on the quantity or quality of effluent to be discharged from the POTW.

(18) If the permit is issued to a publicly owned or publicly regulated treatment works, the permittee shall require any industrial user of such treatment works to comply with federal requirements concerning:
(a) User charges pursuant to Section 204 (b) of the Clean Water Act, and applicable regulations appearing in 40 CFR 35;
(b) Toxic pollutant effluent standards and pretreatment standards pursuant to Section 307 of the Clean Water Act; and
(c) Inspection, monitoring and entry pursuant to Section 308 of the Clean Water Act.

(19) If an applicable standard or limitation is promulgated under Section 301(b)(2)(C) and (D), 304(b)(2), or 307(a)(2) and that effluent standard or limitation is more stringent than any effluent limitation in the permit, or controls a pollutant not limited in the permit, the permit shall be promptly modified or revoked, and reissued to conform to that effluent standard or limitation.

(20) Any authorization to construct issued to the permittee pursuant to 35 Ill. Adm. Code 309.154 is hereby incorporated by reference as a condition of this permit.

(21) The permittee shall not make any false statement, representation or certification in any application, record, report, plan or other document submitted to the Agency or the USEPA, or required to be maintained under this permit.

(22) The Clean Water Act provides that any person who violates a permit condition implementing Sections 301, 302, 306, 307, 308, 318, or 405 of the Clean Water Act is subject to a civil penalty not to exceed $25,000 per day of such violation. Any person who willfully or negligently violates permit conditions implementing Sections 301, 302, 306, 307, 308, 318 or 405 of the Clean Water Act is subject to a fine of not less than $2,500 nor more than $25,000 per day of violation, or by imprisonment for not more than one year, or both.
Additional penalties for violating these sections of the Clean Water Act are identified in 40 CFR 122.41 (a)(2) and (3).

(23) The Clean Water Act provides that any person who falsifies, tampers with, or knowingly renders inaccurate any monitoring device or method required to be maintained under this permit shall, upon conviction, be punished by a fine of not more than $10,000, or by imprisonment for not more than 2 years, or both. If a conviction of a person is for a violation committed after a first conviction of such person under this paragraph, punishment is a fine of not more than $20,000 per day of violation, or by imprisonment of not more than 4 years, or both.

(24) The Clean Water Act provides that any person who knowingly makes any false statement, representation, or certification in any record or other document submitted or required to be maintained under this permit, including monitoring reports or reports of compliance or non-compliance shall, upon conviction, be punished by a fine of not more than $10,000 per violation, or by imprisonment for not more than 6 months per violation, or by both.

(25) Collected screening, slurries, sludges, and other solids shall be disposed of in such a manner as to prevent entry of those wastes (or runoff from the wastes) into waters of the State. The proper authorization for such disposal shall be obtained from the Agency and is incorporated as part hereof by reference.

(26) In case of conflict between these standard conditions and any other condition(s) included in this permit, the other condition(s) shall govern.

(27) The permittee shall comply with, in addition to the requirements of the permit, all applicable provisions of 35 Ill. Adm. Code, Subtitle C, Subtitle D, Subtitle E, and all applicable orders of the Board or any court with jurisdiction.

(28) The provisions of this permit are severable, and if any provision of this permit, or the application of any provision of this permit is held invalid, the remaining provisions of this permit shall continue in full force and effect.

(Rev. 7-9-2010 bah)

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PN Date February 23, 2017

Permit No. IL0002208

Permittee Name Midwest Generation, LLC

PLEASE CHECK THE APPROPRIATE ANSWER AND RETURN:

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X I will post the Public Notice for a period of 30 days, beginning 2/27/17.

_____ I will not post the Public Notice.

Caroline Roberts 2/27/17

Signature Date

IL 532-1579
WPC 528 6/87

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Monday, February 27, 2017 03:42 PM

Invoice

	Belinda A Hafliger	**Invoice Date**	2/27/2017
Agency	Illinois E.P.A.	**PO Number**	WATER - FEBRUARY
	1021 N. Grand Avenue East Springfield, IL 62794-	**Order**	17024IE0
Client	EPA Water Pollution		
Reps	House		

Newspaper

Caption	Run Date	Ad Size	Rate	Rate Name	Color	Disc.	Total
Gurnee Lake County News-Sun							
Public Notice JAR:15042301	02/17/2017	2 x 5.25	$141.18	EPA Govemment Rate	$0.00	0.0000%	$141.18
				Newspaper Total			$141.18
				Newspaper Net			$141.18
Joliet Herald-News							
Public Notice KKD:15013001	02/20/2017	1 x 5.5	$220.00	1/8 Page	$0.00	0.0000%	$220.00
				Newspaper Total			$220.00
				Newspaper Net			$220.00
Moline The Dispatch/The Rock Island Argus							
Public Notice BWC:16033101	02/18/2017	2 x 4	$57.65	EPA Govemment Rate	$0.00	0.0000%	$461.20
				Newspaper Total			$461.20
				Newspaper Net			$461.20
Pekin Daily Times							
Public Notice JAR:16071701	02/17/2017	2 x 4	$21.65	Display Rate	$0.00	0.0000%	$173.20
				Newspaper Total			$173.20
				Newspaper Net			$173.20
Romeoville Bugle							
Public Notice JAR:17011301	02/23/2017	2 x 4	$8.65	Display Rate	$0.00	0.0000%	$69.20
				Newspaper Total			$69.20
				Newspaper Net			$69.20
Taylorville Breeze-Courier							
Public Notice LRL:ILG64	02/26/2017	2 x 4	$7.65	Display Rate	$0.00	0.0000%	$61.20
				Newspaper Total			$61.20
				Newspaper Net			$61.20

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Monday, February 27, 2017 03:42 PM

Invoice

	Belinda A Hafliger	**Invoice Date**	2/27/2017
Agency	Illinois E.P.A.	**PO Number**	WATER - FEBRUARY
	1021 N. Grand Avenue East Springfield, IL 62794-	**Order**	17024IE0
Client	EPA Water Pollution		
Reps	House		

Newspaper Caption	Run Date	Ad Size	Rate	Rate Name	Color	Disc.	Total

Total Advertising	$1,125.98
Discounts	$0.00
Tax: USA	$0.00
Total Invoice	$1,125.98
Payments	$0.00
Adjustments	$0.00
Balance Due	$1,125.98

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PUBLIC NOTICE OF DRAFT PERMIT

Public Notice Number JAR:15042301 is hereby given by Illinois EPA, Division of Water Pollution Control, Permit Section, 1021 North Grand Avenue East, Post Office Box 19276, Springfield, Illinois 62794-9276 (herein Agency) that a draft modified National Pollutant Discharge Elimination System (NPDES) Permit Number IL0002259 has been prepared under 40 CFR 124.6(d) for Midwest Generation, LLC for discharge into Lake Michigan from the Waukegan Generating Station, 401 East Greenwood Ave., Waukegan, Illinois 60087, (Lake County).

The station operates two coal fired boilers to supply steam to two generating units, designated units 7 and 8 with a combined nominal capacity of 742 MW. The station withdraws water from Lake Michigan for condenser cooling, house service water and boiler feed water. Wastewater is generated from once-through condenser cooling, conditioning boiler feed water, backwashing the condenser cooling water intake screens, non-chemical cleaning of plant equipment, ash handling, and precipitation which contacts the site.

Plant operation results in an average discharge of 739 MGD of condenser cooling water and house service water from outfall 001, an intermittent discharge of boiler blowdown from outfall A01, 0.06 MGD of reverse osmosis wastes from outfall B01, 8.13 MGD of wastewater treatment system effluent from outfall C01, 0.676 MGD of east yard basin overflow from outfall D01, an intermittent discharge of unit 7 demineralized water storage tank drain from outfall F01, and an intermittent discharge of non-chemical metal cleaning wastes from outfall G01.

The application, draft permit and other documents are available for inspection and may be copied at the Agency between 9:30 a.m. and 3:30 p.m. Monday through Friday. A Fact Sheet containing more detailed information is available at no charge. For further information, call the Public Notice Clerk at 217/782-0610.

Interested persons are invited to submit written comments on the draft permit to the Agency at the above address. The NPDES Permit and Joint Public Notice numbers must appear on each comment page. All comments received by the Agency not later than 30 days from the date of this publication shall be considered in making the final decision regarding permit issuance.

Any interested person may submit written request for a public hearing on the draft.

If written comments and/or requests indicate a significant degree of public interest in the draft permit, the permitting authority may, at its discretion, hold a public hearing. Public notice will be given 30 days before any public hearing.

Electronic Filing: Received, Clerk's Office 10/31/2022

Illinois Environmental Protection Agency
Division of Water Pollution Control

Fee Exempt No

NPDES Permit Lifecycle Worksheet

Wednesday, November 09, 2016

Facility Midwest Generation-Waukegan BOW ID W0971900021 Major Maj ☐ Initital Fee Paid

County Lake Engineer Jaime A. Rabins Unit Industrial

NpdesId IL0002259 Expiration Date 3/31/2020 Effective 4/1/2015 Region Des Plaines

Request Type	Date	Notes
Permit Modification Request	9/2/2016	Deminerlizers to RO
Permit Modification Request	4/12/2016	RO Additives
Permit Modification Request	10/3/2013	Trona Mill Wash

Date Received		9/2/2016
Approved by Reviewer for 15-Day Notice	JAR	11/9/2016
Approved by Unit Manager	DEL	1/24/17
To PN Clerk for 15-Day Notice	BAH	1/24/16 - 2/8/16
Re-15-Day Notice		
Returned to Reviewer	BAH	2/8/17
Approved by Reviewer for 30-Day Notice	JAR	2/8/2017
Approved by Unit Manager	DEL	2/10/17
To PN Clerk for 14/30-Day Notice	BAH	2-17-17 - 3-20-17
Re-30-Day Notice		
Returned to Reviewer	BAH	3/22/17
Approved by Reviewer for Issuance	JAR	3/28/2017
Approved by Unit Manager		
Approved by Section Manager	DEL	4/7/17
Permit Issued	DA	4-10-17

Action

☐ Permit	☐ No Permit Required	☐ Void	☐ Fee Exempt
☒ Modification	☐ Refusal of Modification	☐ Fee Category	
☐ Termination	☐ Denial	☐ CSO Category	

Electronic Filing: Received, Clerk's Office 10/31/2022

Exhibit

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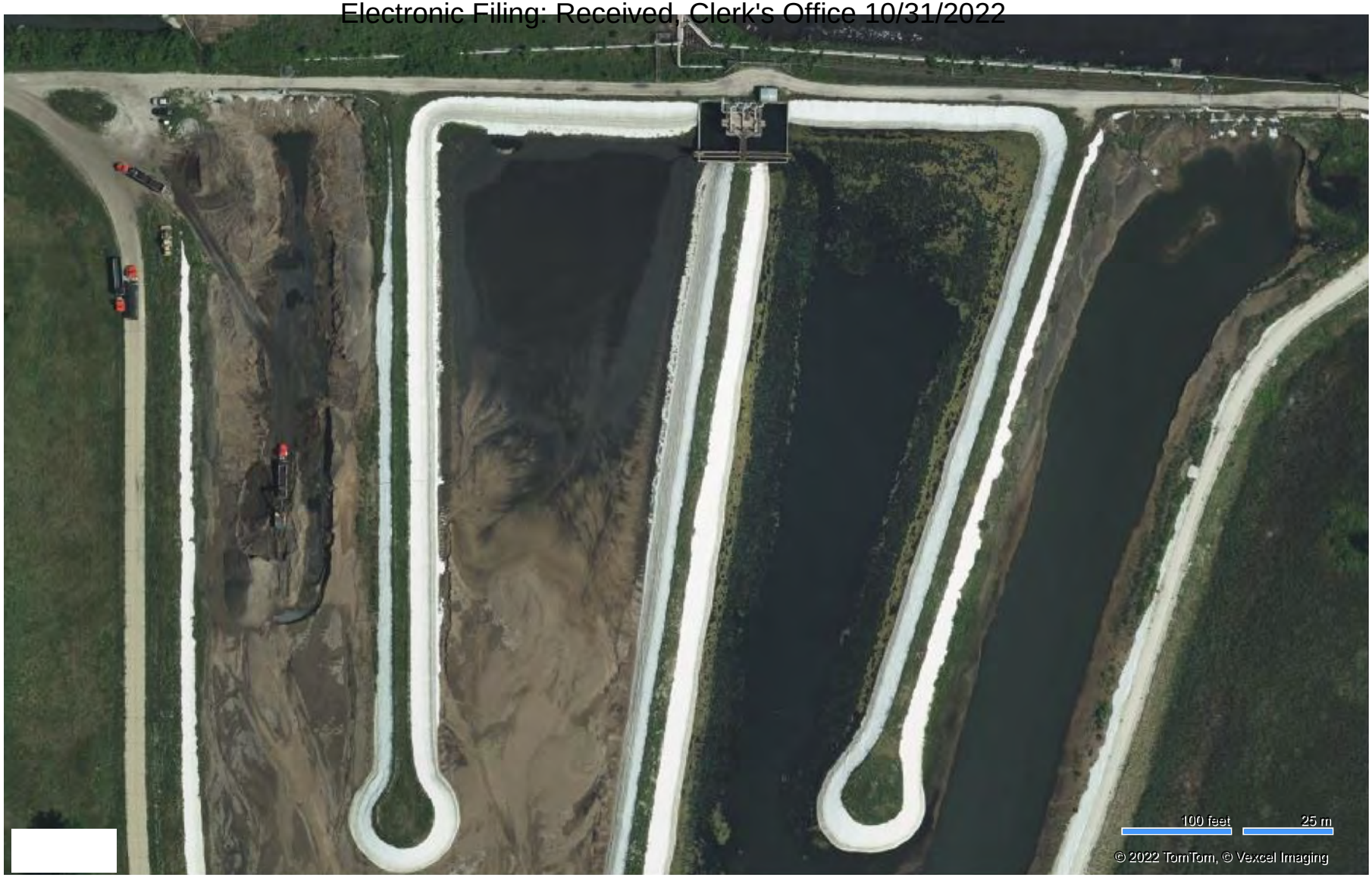

Data from: Wikipedia · Freebase

Waukegan Generating Station
Machinery Use Aerial Photograph
Illinois Environmental Protection Agency, Bureau of Water